

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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# THE IRON AGE

New York, Thursday, May 18, 1905.

## The Hicks Gasoline Electric Motor Car.

In the scheme for its operation the gasoline electric railway motor car herewith illustrated is similar to the forty passenger automobile described in *The Iron Age* September 22, 1904. The essential features in the equipment of both are the same, consisting of a gasoline engine driven generating set, motors for imparting power to the wheels and storage batteries for equalizing the load on the generator and starting the engine from rest by driving the generator as a motor. The car was recently designed and built in the locomotive and car shops of F. M. Hicks & Co., Chicago Heights, Ill., for the St. Joseph Valley Traction Company. An exterior view of the car is shown in Fig. 1, and an interior view in Fig. 2.

The car is 34 feet long over the end sills, 9 feet 8 inches wide over the side sills, 14 feet high over all, and is divided into two compartments, an engine room and a baggage room. Externally it is finished in Pullman standard color with gold striping and lettering. The trucks are the heaviest design of street railway trucks, with 33-inch wheels and were built by the St. Louis Car Company.

Power is supplied by a four-cylinder gasoline engine of the marine type, built by the Marinette Gas Engine Company. Under factory tests this engine developed an electrical horse-power of 70 at 325 revolutions per minute from one pint of gasoline per horse-power-hour. The cylinder jacket water is circulated constantly by a rotary pump belted to a pulley on the engine shaft and is cooled



Fig. 1.—Gasoline Electric Railway Motor Car, Built for the St. Joseph Valley Traction Company by F. M. Hicks & Co., Chicago.

looking from the center toward the left end of the car in the position in which it appears in Fig. 3.

The framing of the car was designed to afford sufficient strength to support the concentrated loads upon the floor and avoid all unnecessary members. It comprises two center sills of 6-inch 14 $\frac{3}{4}$ -pound I-beams, two side sills of 5 x 8 inch, and four intermediate sills of 4 x 6 $\frac{1}{2}$  inch yellow pine, these eight sills forming the longitudinal under-framing, while the transverse under-framing consists of two end sills of 8 x 12 inch oak, two transoms, each made of two wrought iron plates 1 $\frac{1}{2}$  inches thick by 10 inches long, and several 2 $\frac{1}{4}$  x 6 $\frac{1}{2}$  inch floor joists. The under-framing is tied with transverse  $\frac{5}{8}$ -inch wrought iron tie rods. The floor is two thicknesses of  $\frac{3}{4}$ -inch pine separated by a layer of Neponset paper. The side-framing is extra heavy and is reinforced by continuous blocking. Although the under-framing is proportioned with a large factor of safety, additional provision has been made to transmit stresses due to excessive bending moments upon the under-framing to heavy wrought iron car lines which serve as trusses across the deck of the car. The body is trussed by two 1 $\frac{1}{2}$ -inch rods with 1 $\frac{3}{4}$ -inch ends. The structure as a whole is so solidly and compactly built that vibration is practically eliminated.

by passing through 800 feet of  $\frac{3}{4}$ -inch automobile radiator pipe and a supply tank of 190 gallons capacity. Radiation of heat from the radiator is augmented by two 42-inch fans placed horizontally under the radiator, running at 300 revolutions per minute and exhausting the air through ventilators in the upper deck.

The engine is direct connected to a Sprague 50-kw. 250-volt direct current generator, which supplies current to four 35-horse-power motors mounted upon the trucks. A battery of 120 chloride accumulators provides for the heavy load which is thrown upon the generator for an instant while accelerating when starting. The normal rating of each cell is 2.08 volts, and the 120 cells connected in series give a combined potential of 249.6 volts. The cells are placed in well ventilated lockers painted internally with asphaltum paint. The gases arising from the battery are drawn from the lockers and exhausted through the ventilators by the fans previously mentioned.

The leads from the battery are carried to a switch-board of special design and there connected in multiple with the generator leads to the main controller leads. By this method of connecting when a heavy pull comes upon the generator and its voltage drops below that of the battery the latter shares the load, and when the load

does not require the full normal output of the generator the excess current recharges the battery. Circuit breakers, adjustable for a series of amperages, are connected in the battery and generator leads to the switchboard to remove the necessity of replacing blown out fuses.

In addition to the traction load the generator supplies current to a 4-horse-power motor compressor connected with the air brake system, current for lighting

by means of a single pole four-point switch, connected with a series of resistances, current may be gradually introduced into the armature, causing the generator to run as a motor. The switch is thrown to its other position when the engine has started, placing the field current under the control of the rheostat.

The second method of starting employs compressed air to drive the engine pistons until the engine is in operating condition. The air is supplied by a compressor belted to a pulley on the engine shaft. The compressor has a capacity of 5.9 cubic feet of free air per minute at 165 revolutions per minute and maintains a pressure of 200 pounds per square inch in two cylindrical steel reservoirs. The latter are also connected with the reservoirs of the air brake system, in which 90 pounds pressure is maintained, through a reducing valve, so that if the motor compressor should be disabled the air brakes could still be operated.

The mechanical and electrical equipment of the car occupies one-third of the floor space and has a total weight of about 25 tons. The following are the separate weights:

	Pounds.
Gas engine.....	18,000
Generator .....	6,000
Storage battery.....	9,250
Motors .....	10,000
Body and trucks.....	33,800
Gasoline tank, full.....	2,000
Jacket water and tank.....	2,000
Miscellaneous .....	4,000

Approximate total..... 84,850

It is believed that the car will easily meet the conditions for which it was designed—an efficient interurban service. No efficiency test has as yet been made, but in a trial trip through the yards at the shops a speed of 25 miles per hour was attained with ease.

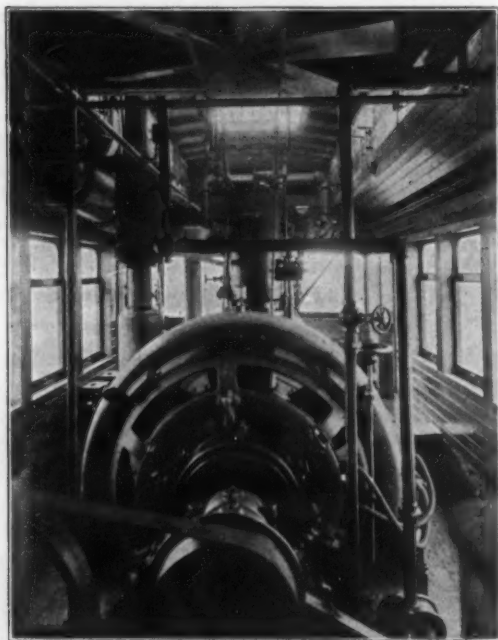


Fig. 2.—Interior View in the Engine Room Compartment.

and for charging a small storage battery used in the gas engine ignition. The car is equipped with the National Electric Company's automatic air brake system and an emergency hand brake rigging. In the upper deck, directly over the gas engine cylinders, are two hinged trap doors through which the cylinder heads and pistons may be removed. These also serve as a means for ventilating

The Engineering Agency was started in 1893 by Frederick A. Peckham, Monadnock Block, Chicago. During the twelve succeeding years this bureau has filled approximately 10,800 positions with competent technical men. One feature has been the supplying of instructors and professors for the principal colleges of engineering. It is significant that all these 10,800 men have been placed at maximum salaries. The agency now has 500

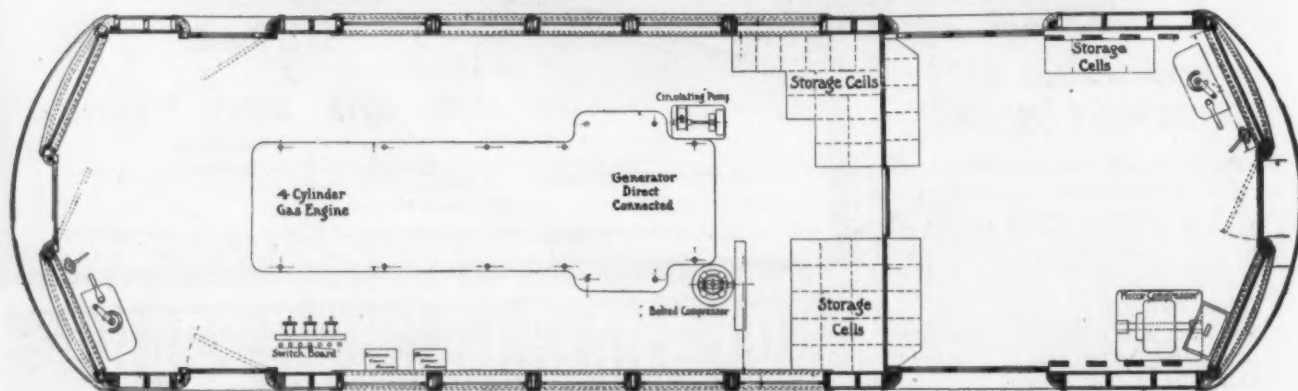


Fig. 3.—Plan of the Plant in the Hicks Gasoline Electric Motor Car.

the car in fair weather. The gasoline supply is carried under the car in a heavy galvanized iron tank of 125 gallons capacity. Gasoline is fed to the engine by a small reciprocating pump. The supply is always greater than the engine requires, and the surplus drains to the reservoir through an overflow pipe.

The difficulty of starting the gasoline engine is overcome by two methods, either of which may be used independently. The one which will probably be used and was alluded to in the first paragraph is that of driving the generator as a motor from the storage battery until the engine takes up its load. A switch is connected in the field leads between the generator and the field rheostat. In one position of this switch the field of the generator is connected with the storage battery and excited; then

open positions on its books. Applicants give complete records of past experience and furnish such references as will guard the bureau in placing only skilled men.

The Abner Doble Company, San Francisco, announces that arrangements have been made with the John McDougall Caledonian Iron Works Company, Limited, Montreal, Canada, whereby the latter becomes sole licensee for the manufacture of the Doble system of water wheels in the Dominion of Canada. The McDougall Company has extensive machine works, and its plant is therefore well equipped for the manufacture of water wheels and other hydraulic machinery. The McDougall Company has retained the Abner Doble Company as consulting engineer.



## The Hastings Tunneling Shield System.

There are two subjects that have received more than ordinary attention from the engineering profession during the last few years and in that time have undergone a wonderful development. One of them is the construction of tunnels, particularly subaqueous tunnels, and the other the use of reinforced concrete in structural work. Each is and has been a very important line of work, but there has been nothing in common between the two. It has remained for C. G. Hastings, a tunnel engineer of many years' practical experience, to propose an association of the two in a subaqueous tunnel wherein reinforced concrete takes the place of cast iron or steel in the walls or shell. While the scheme has not yet been put into actual use its feasibility seems reasonable, and at any

rear end of the shield, where they are united by a series of radial perforated segment plates. Intermediate of the ends the cylinders are mutually supported by longitudinal stiffeners, between which is formed a series of compartments, wherein are placed the hydraulic jacks that are used to advance the shield. These extend through the holes in the segment plates, being secured to them by lag screws passing through the bearing collars of the jacks. Within the hood, which is a continuation of the outer cylinder of the shield, the lining of the tunnel is built up, and to advance the movement of the shield the several hydraulic jacks react against the tunnel lining.

The interior of the shield is divided by vertical and horizontal walls into convenient working chambers of dimensions depending upon the size of the tunnel diameter. The vertical partitions are of truss construction

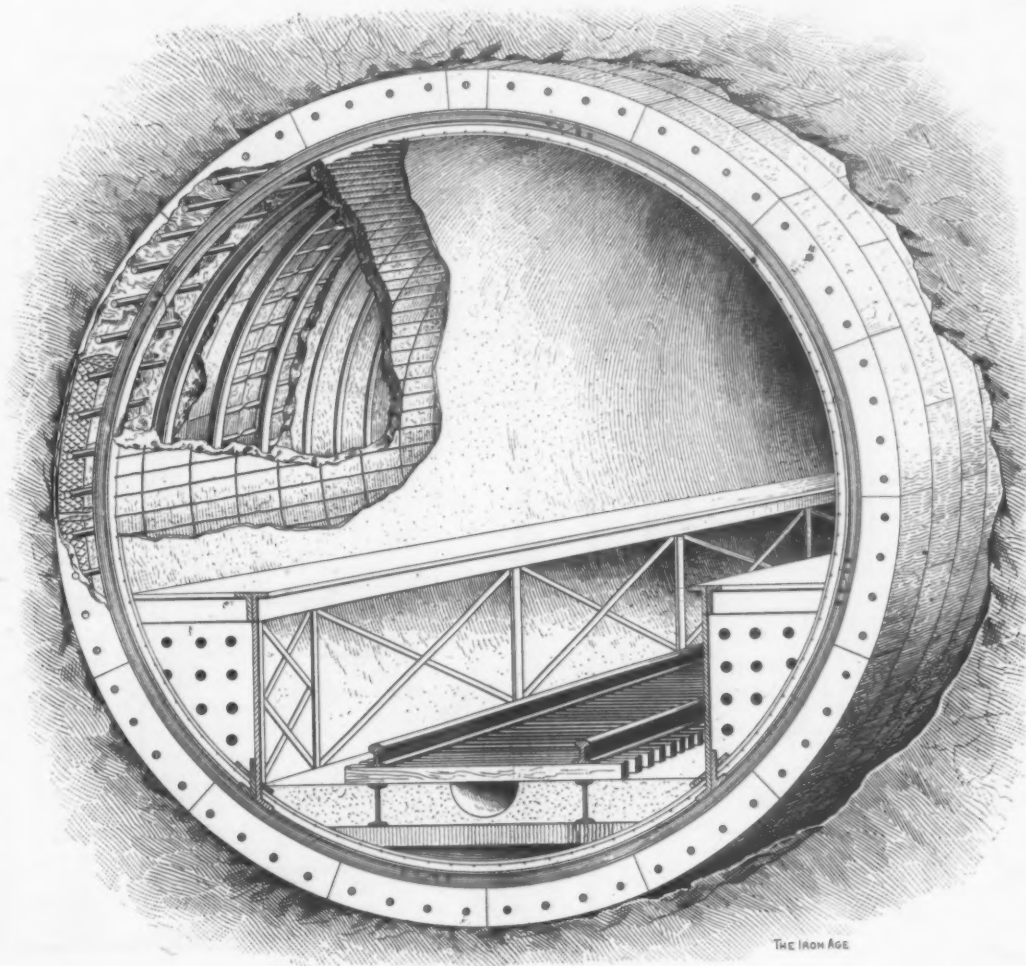


Fig. 1—Section of the Hastings Reinforced Concrete Tunnel.—The Broken Parts Show Successively the Reinforcing in the Molded Blocks, the Circular Beams, Their Tying Connections, the First Coat of Concrete, the Woven Wire Reinforcing and the Finishing Coat of Cement.

rate the idea offers suggestions that make it worthy of investigation.

Whatever may be said of the tunnel system the tunneling shield with which the inventor intends to construct the tunnel is no experiment, as it has been used with great success in the building of a noted tunnel which is now completed and in use.

The tunnel lining is to consist of metal reinforced concrete, forming an impervious artificial stone, molded into convenient segment blocks. The several parts entering into the construction of the reinforced concrete tunnel walls are shown in the section, Fig. 1, which is partly broken to expose them successively. Before taking up the tunnel proper, however, it will be well to thoroughly understand the construction and manner of using the shield.

The tunneling shield, shown in Figs. 2, 3 and 4, consists of two concentric cylinders, one inside the other, united at the cutting edge by a series of radial ogee plates. Both cylinders extend from the cutting edge to the

and the horizontal partitions of plate metal, all being substantially reinforced by curved steel plates extending rearward from the cutting edge a certain distance to best resist any strains that may be brought to bear upon the partition members. The curved plates are so arranged as to deflect all soft sliding or inflowing material and to prevent excavated material at the heading from becoming lodged against flat or abrupt surfaces in the chambers. In this manner the material is caused to pass through the shield to the bulkheads, where any treacherous material may be easily controlled. It should be mentioned that the strength of the shield is not dependent upon these dividing walls, as the concentric cylinders forming the shield proper are sufficient in themselves, and when the shield is of small enough diameter to require no more than one chamber the dividing walls may be and have been dispensed with.

The bulkheads are provided with sectional perforated doors carried on heavy hinges, and can be conveniently

opened in whole or in part as the occasion or condition may require. If saturated or unstable material is encountered the doors can be quickly closed in any or all chambers of the shield, leaving the perforations of the doors open for the passage of the material. This permits the continued forward movement of the shield, and so does not arrest the progress of the work.

If the material outside of the shield is of such an extremely soft character as to flow too freely through the door perforations, which might cause a settlement or displacement of the earth enveloping the outer periphery of the shield, the perforations can be quickly closed in any chamber, independently of the others, or in any part of a single door by sliding gates attached for that purpose, thus arresting the inflow of matter until the shield has

the tunnel and removes very largely the likelihood of later deformation.

It may be seen that the elementary features of the Hastings shield are of a practical character well adapting it to working where the conditions which will be met with cannot be definitely determined in advance, as in most underland and submarine construction. Its practicability through a soil of varied character was demonstrated when it was used in the construction of 4139 feet of 24 foot 9 inch bore on the main conduit of the Chicago intercepting sewer system. The strata formation consisted of varying materials, one underlying the other on part of the work, while on another section the work passed entirely through running gravel and saturated quicksands.

The impervious reinforced tunnel lining has for its

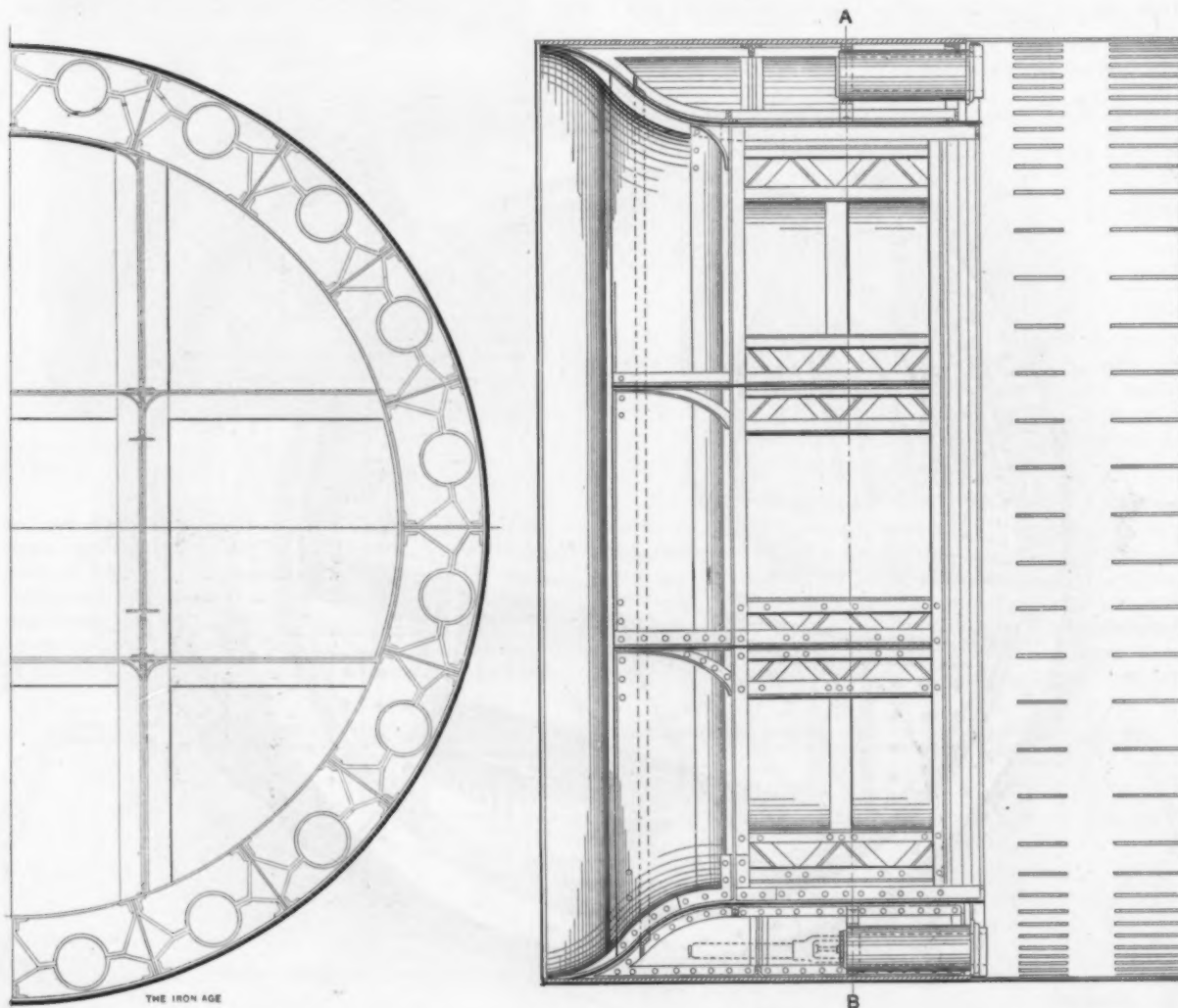


Fig. 2.—Half Transverse Section and Longitudinal Section of the Hastings Tunneling Shield.

been advanced into the heading sufficiently to compress the mud within the belled periphery of the shield, where it is concentrated, and may then be deflected in the regular course to the working compartments and, coming in contact with the sectional bulkheads, may be removed through the doors.

If rock boulders or other hard material is encountered the doors in a plane with such material may be thrown open while the obstruction is removed by drilling and blasting. When working in dry clay in a normally safe state the doors are entirely open for a free and rapid passage of the excavated material.

The rear hood of the shield is designed so thin that the tunnel lining in course of erection conforms very closely to the bore made by the shield and prevents any greater displacement of the surrounding earth than is necessary for the convenience of proper construction. This is particularly of advantage where the tunnel runs under streets or buildings and any settlement would be dangerous. Moreover, it insures a more uniform load on

foundation structure a series of metal reinforced segment blocks molded into a crystallized mass by an improved method without the use of tamping or pressure. The reinforcing is imbedded in proper positions to distribute the strains to which it is to be subjected. There are also imbedded in the concrete blocks appliances to assist the work of erection. Each block is placed in position by a rotary segment hoist connected with the shield and pressure is brought to bear upon the blocks to force them into proper position by the hydraulic jacks which shove the shield forward. Elastic water proof pads are inserted in all circumferential and abutting joints of the blocks to aid in imbedding each ring of segments in perfect conformity with the erected work and to render all seams water proof. A coating of water proof material is applied to the inner surface of the segment blocks when each ring has been completed, after which a reinforcement of circular steel beams is placed in position. There is one beam to each ring of blocks, which is secured to them by appliances molded in the blocks at the



time they are made. The circular beams are reinforced and stiffened by connecting longitudinal bars of special form attached at equal intervals around the circumferential beams. A suitable distance from the inner periphery of the beams and their connecting bars is placed a cylinder of expanded metal in spiral form or a netting of heavy steel wire, such as Page woven wire fencing. The inventor favors the latter as having some advantages over expanded metal. Over the netting is applied a homogeneous coating of cement concrete, completely imbedding all the metal reinforcement. The interior surface is then troweled to a smooth finish.

This system of concrete tunnel construction is recommended for tunnels for railways or traffic purposes of any kind, and is claimed to be of extreme durability and of decidedly moderate first cost as compared with tunnels made

and convenience. Another bill made Saturday afternoons and Election Day legal holidays in Chicago. Directors of public libraries were authorized to issue 6 per cent. 20-year bonds in order to raise money for the purchase of sites and the location of branch libraries. Coal operators and manufacturers were authorized by bill to form mutual casualty and insurance companies. Another bill made wages and salaries of officers and employees of county, city, township, village and school district subject to garnishment. The city of Chicago is authorized to submit to its citizens at the next general election a new charter, which charter provides, among other things, for the increase of the term of Mayor from two to four years; the abolition of all fees formerly collected by officers of the city; the compensation of officers to be only on a salary basis; all fees and moneys collected

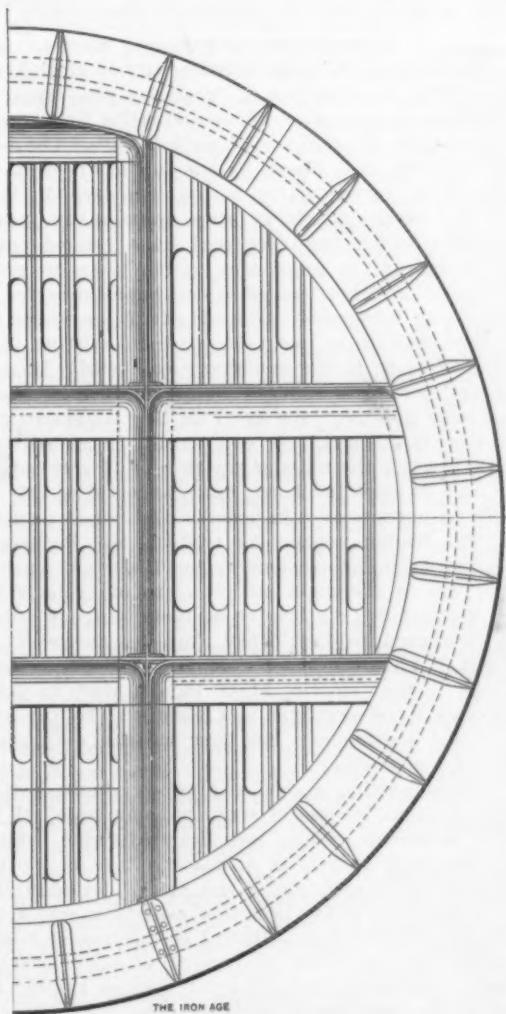


Fig. 3.—Half Front View of the Hastings Tunneling Shield.

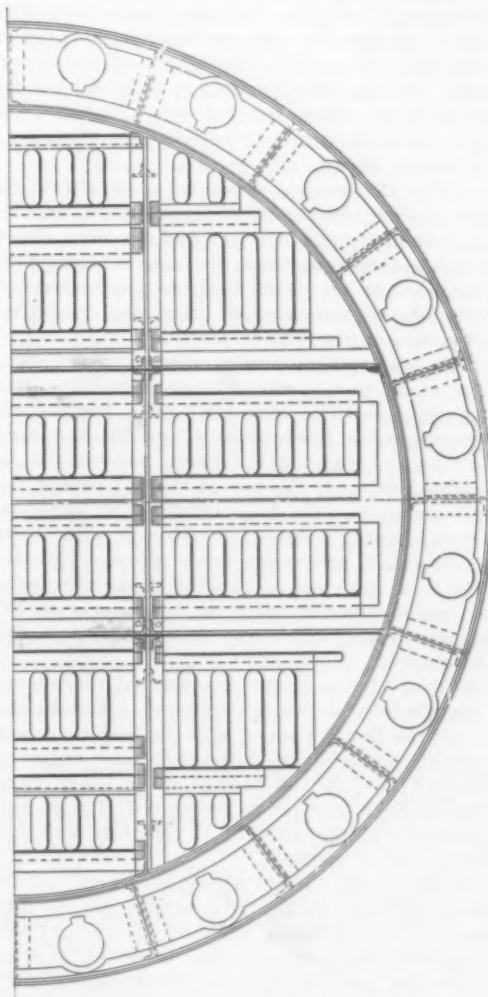


Fig. 4.—Half Rear View of the Hastings Tunneling Shield.

in accordance with present day practice. The inventor, Cornelius G. Hastings, has secured patents covering the essential parts of his inventions for the United States, Canada and Great Britain, and has other patents pending applicable to construction work of a mechanical and civil engineering nature.

#### New Illinois Laws.

The Illinois State Legislature, which has just adjourned, passed, among other enactments, a bill permitting the city of Chicago to sell surplus electricity and to regulate the maximum price at which electricity and gas may be sold by existing corporations. It also authorized the West Park Commissioners of Chicago to issue bonds to the amount of \$2,000,000 to pay for completion of the small park system. This appropriation will be expended largely in the purchase of ground and the erection of gymnasiums and other buildings for public education

by any officer or department to go to the city treasurer. Interest on funds in the hands of the city treasurer is to belong to the city and the comptroller shall deposit city funds in whatever bank makes the highest bid as the result of public letting to be made each year. This charter will also empower the city to acquire by purchase or otherwise municipal parks, playgrounds, beaches, bathing places and to build improvements thereon. Nearly all of these enactments will serve to stimulate industrial activity, particularly in the line of building. The Illinois-Michigan Canal Commissioners were empowered to sell the section of their canal extending from Chicago to Joliet, Ill., about 35 miles in length, as the drainage canal offers a better channel for commerce. It is expected that this right of way will bring more than \$1,000,000, which money the commissioners will expend in enlarging and improving the plant below Joliet. A State Highway Commission was created and an appropriation of \$25,000 was made for the purpose of conducting experiments in good road making throughout the State.

## A Review of Metallurgical Progress.

R. A. Hadfield, the well-known steel manufacturer of Sheffield, has just delivered before the Iron and Steel Institute an able address as the new president, in which he deals with many interesting questions affecting the iron industry. We abstract from this paper the following passages relating to recent progress in metallurgy:

Whether electro-metallurgy can be applied to the economical production of iron and steel remains to be proved. Unfortunately there seems to be fixed in the minds of some of those exploiting such processes the idea that all steel now made is radically of bad quality. This, I need not say to this audience, is not the case. It is wonderful how modern steel meets the varied and complex requirements of the times. Besides, with the alloys of iron and carbon which we call steel, it matters little in what form fusion takes place, so long as the product gives off the analysis needed. Cost is the chief practical consideration. Mysterious virtues have been claimed for electrically produced steel, but its very freedom from some of the elements which it is desirable should be present has been a defect.

The Canadian Government appointed a commission to report upon various electric smelting processes, and its report states that electric energy need be very cheap indeed to enable these processes to compete at all with the blast furnace. In fact, such methods may be termed, at any rate for the present, not practicable; so that blast furnace owners can breathe freely.

The French Electro-Metallurgical Company of Froges and La Praz, under the superintendence of M. Héroult—who has recently received a reward from the Société d'Encouragement pour l'Industrie Nationale—has done excellent service in studying the many problems to be solved in connection with the use of electric energy for metallurgical purposes. He deals chiefly with smelting, either for producing the metals themselves or such alloys as silicon, chromium and other ferro alloys. He also treats of pig iron and steel of various kinds and qualities. The company named, with its new works at St. Michel de Maurienne, will have about 35,000 horse-power at its disposal.

"Electric steel" has a catching sound, but there is no virtue in the electro-metallurgical process. It is to the quality of the product we must look in order to see whether this steel can show superiority over ordinary kinds. Whether the cost of production is lower than that of older systems has yet to be proved; the energy must be generated at low cost or it certainly will not compete with existing methods.

When the day comes in which electric energy can be produced more cheaply—and this is perhaps not far distant—we may have a different state of affairs, and the process of electric smelting may then be of value commercially. It has been worked out theoretically that with no loss of heat energy about 131 electric horse-power days (24 hours) are required to produce a net (2000 pound) ton of iron from 65 per cent. pure ore, but in actual practice it has been found in Sweden that 362 electric horse-power days were required for the purpose.

A. J. Rossi states that he has, in the Adirondacks, produced iron from titanium iron ore at a rate of \$12.50 per ton; this, he says, equals blast furnace practice. But this ore was reckoned at 75 cents per ton, and that, in a comparison cost for the blast furnace at \$2.50, is not reasonable. Further, this estimate was based upon the cost of \$10 per year for 1 horse-power of electric current delivered, night and day, week in and week out. This is probably much too low. There are, moreover, other considerations which will put the electric method out of court. A complete blast furnace producing 350 tons of pig iron per day would cost about £200,000. It is stated that an electric furnace plant to produce a similar quantity would require a water power electric plant with a capacity of at least 60,000 horse-power. There are few places where this could be obtained; besides, the cost of the plant would be excessive. Pig iron has been produced by the blast furnace at as low as \$8 per ton. It may be interesting to add that the total of the world's water power electrical installations is now estimated

at about 1,500,000 horse-power, of which one-third is in America, one-sixth in Canada, one-tenth in France and about one-seventh in Italy. Great Britain has only about 1½ per cent., or about 12,000 horse-power.

J. W. Richards, the president of the American Electro-Chemical Society, in his opening address last year dealt in an able manner with "The Continuous Advance of Electro-Chemistry." He seemed to think that the possibilities in this direction were very great. On first seeing "half a ton" of silicon isolated, he said: "Can it become as useful as iron, or applications be found for an element of which the earth is so largely composed? In any case it is only the electro-chemist who could have made it." Great credit is due to the early workers in this important branch of scientific manufacture, the Brothers Cowles, Waldo and Hunt, who fought their way to success through difficulties innumerable.

### Manufacture of Ordinary Steel.

Improvements in the manufacture of steel have been of late in the direction of producing new types and in methods of treating, working and using these new types rather than in processes of manufacture. The handling of enormous steel plants in America has been in connection with comparatively old systems, which, in themselves, remain much as they were many years ago. Changes which have occurred have related chiefly to improvements in machinery rather than to processes. Although modifications of minor importance are gradually being introduced, it is difficult to see where further radical departures can take place in existing processes themselves or in the machinery employed. It is rather to the material produced that attention is now being specially devoted. We are told that American practice is now to "squirt"—it can hardly be called rolling—rails through the mills at the rate of 15 feet per second, or over 10 miles per hour; but, wonderful as this is, it is only an improvement in practice and not in principle.

The Talbot continuous method, the Bertrand-Thiel process, each finds supporters, but important as these are they are in the main modifications of systems long at work—that is, they involve no important new principles. With regard to the Talbot furnace, one used by the Jones & Laughlin Steel Company, Pittsburgh, has produced in four months 21,000 tons of steel, exceeding by 3000 tons the previous best record. The furnace was operated continuously for four months, only going out of use for repairs.

An interesting method of producing basic open hearth steel without the use of scrap is being tested at Ensley, Ala. A 250-ton rolling open hearth furnace, which may be described as a sort of metal mixer or "primary" furnace, is charged with direct metal. In addition there is a standard 15-ton Bessemer converter, which enables material to be finally delivered to the regular basic open hearth furnaces after the removal of silicon and carbon. The phosphorus elimination can thus be rapidly carried out in the open hearth furnace.

The many improvements in the composition of special steels will be dealt with in other sections, but reference may be here made to the Harmet method for producing ingots free from piping and settling, with consequent avoidance of waste. F. C. Fairholme, one of the managing directors of Cammell, Laird & Co., informs me they have found this method of practical advantage. It would be interesting to know whether these ingots show any signs of "streaks," a cause of difficulty which has been found to give much trouble in the manufacture of gun steel. The American Navy and Army bureaus have both dealt with this phenomenon in several reports. Riemer, with the hot gas blast pipe, and Goldschmidt, with his aluminum-thermo process, also aim at producing results similar to those of Harmet in quite different manners.

*Steel Making in Japan.*—Our friends the Japanese, with characteristic enterprise, have taken up the manufacture of steel, and although the Government works have not been altogether successful, there is no doubt that in time they will prove of great service in supplying local requirements. One of the Government works, Wakamatsu, the largest undertaking of the kind in the country, has manufactured during the year over 30,000 tons of steel rails. It is in the neighborhood of an abun-



dant coal producing district and is conveniently situated for the importation of iron ore from China.

#### Alloys of Iron with Other Elements.

**High Speed Tool Steel.**—In America Messrs. Taylor and White, by their researches, not only upon the composition of steel, but also upon its treatment, have shown how to apply some of these special steels to important uses, including the production of high speed tool steel, a subject upon which great advances have been made lately. To these investigators is largely due the important advance in practice from which to-day nearly every machine shop in the world is benefiting.

J. M. Gledhill, in his paper on the "Development and Use of High Speed Tool Steel," has given valuable information to the world. He indicated that this steel was in many ways so much in advance of the design of machine tools that makers of the latter had to increase the efficiency of the machines in which high speed tools were used. Mr. Gledhill stated that with this steel turning can be done in certain instances at the rate of 500 feet per minute; a wonderful advance on past practice. High speed tool steel is most difficult to produce, the waste, cost of rolling and preparation being very high; and the rarer elements which have to be used necessarily make the material costly if it is to be trustworthy.

It is satisfactory to find that Sheffield still maintains its ancient renown by the advances it has made in this new and important branch of industry.

**The Wide Use of Alloy Steels.**—When it is remembered how large has become the demand for alloy steels it is noteworthy in how short a time the work bearing on their composition has been accomplished. The year 1888 may be taken as that in which systematic and useful practical work commenced. In about 17 years this remarkable and indeed revolutionary advance has been made. Metallurgists can proudly claim they have not been wasting their time or their efforts. The world at large hardly realizes the great debt owing to them, though through their labors it is deriving some of the greatest benefits it now enjoys.

If alloy steels were taken away there would be an end of progress, so much does advancing civilization depend upon the work of the modern metallurgist. Many of our conveniences, our comforts and—in war material—many of our defenses are directly due to metallurgical research and the practice that springs from it.

**Special Ferro Alloys.**—The importance of the class of metallurgical products known as special ferro alloys is now very great. It is largely by their aid that special steel and iron alloys can be produced.

J. H. Pratt of the United States Geological Survey in his recent interesting report, under the heading of "Steel Hardening Metals," gives a list of the various elements, among them chromium, nickel, molybdenum, vanadium, cobalt, titanium, uranium. The term "hardening" is not, however, altogether correct, as these metals, unless carbon be present, do not really harden iron.

Ferromanganese, containing 80 per cent. manganese, first produced in 1875, and costing, even 20 years ago, £100 per ton, can now be obtained for about one-tenth that price. It was originally produced in 1865 by Henderson in England and by Prieger in Austria, the alloy being made in crucibles. The Terre Noire Company purchased the Henderson patent rights and originated the manufacture of rich alloys in the blast furnace.

Ferrosilicon is now very valuable in its many uses, and can be obtained of almost any desired percentage as well as combined with manganese in the ferro alloy known as silicon-spiegel. Ferrochromium is also supplied of various percentages and at comparatively moderate prices; the almost pure form of the metal itself is produced by the Goldschmidt process. Ferrotungsten, ferromolybdenum and ferrovanadium may also be obtained, although, owing to their greater rarity, at higher prices. Nickel and ferronickel are now made on a large scale and at reasonable rates, compared with the almost prohibitive prices of but a few years ago. Many of these special ferro alloys are being largely produced by means of the electric furnace in France, in America, in Canada and elsewhere.

#### Heat Treatment.

One of the most important branches of the metallurgy of iron and steel to-day is that relating to heat treatment, and in using the term I am here referring to something apart from heat treatment for hardening purposes.

Why, it may be asked, is heat treatment found to be so important? It is because on the temperature employed to produce a particular condition in the steel rest the final physical and mechanical properties of that material. For example, a nickel-chromium-iron alloy as forged may appear to be of no commercial value, but by judicious heat treatment, with or without quenching in oil or water, its elastic limit may be made to vary from 22 to 60 tons per square inch, its tenacity from 40 to 96 tons per square inch, and its ductility from 8 or 10 per cent. to 30 or 35 per cent. We still understand but dimly why these effects are produced, but in the main, no doubt, they are owing to resultant variations in the form of the carbide, or hardening carbon, present, or to almost infinite shades of conditions or combinations of the two. Seeing that there are now already more than 80,000 different carbon compounds known to exist, the extraordinary and marvelous influence and power of carbon when alloyed with iron need not be a matter of wonder.

While other metals are affected by variations in temperature, not one of them seems so sensitive as iron and its alloys. It is stated that even the temperature of boiling water at atmospheric pressure will gradually soften hardened carbon steel; certainly at 200 degrees C. changes occur.

Not long ago, in a discussion before the Institution of Mechanical Engineers, S. N. Brayshaw stated that he could detect differences in the quality of steel hardened at temperatures only varying from each other by 2 or 3 degrees C., and specimens since submitted to me by him appear to bear out his claims. We know that there is a variation of only a few degrees between the temperature at which ordinary hard carbon steel will or will not harden; and, no doubt, equally fine shades of difference prevail at higher temperatures.

The facts we have already learned in this field emphasize the universal lesson of all scientific research, of how important it is not to rest satisfied with the known, but to explore minutely and exhaustively beyond the bounds of present knowledge.

#### Metallography.

This now very important branch of scientific research has been found of great value, and although some have been disappointed with the results obtained, it must not be forgotten that those best able to handle this weapon for exploration work point out that its results must be correlative—that is, they should be taken in conjunction with both chemical and mechanical work.

It is not often that the real pioneer of an important advance can be so clearly indicated as in this case; but the metallurgists of the whole world have generally admitted that we are indebted to one of Sheffield's citizens and a member of this Institute, Dr. H. C. Sorby, for this valuable aid to metallurgical research. As far back as 1857 he made the first application of microscopy to the examination of the structure of iron and steel.

There has, unfortunately, been a tendency to multiply the names of micro-constituents. Owing to the many varieties of structure met with this has been to some extent unavoidable; but many of these names give a wrong impression to the student, although the constituents have been usefully defined. It must be remembered that a student at the commencement of his career has to learn from what he is told and not what from what he himself knows. For example, no one has ever yet separated martensite; and while the designation is useful it would be less liable to misconception if this supposed constituent were known as martensitic structure. The same remarks apply to sorbite; it would be much better to speak of sorbitic structure. The currently accepted designations of the various constituents of steel used in metallography must be taken with some caution, as there is at present much difference of opinion as to their meaning.

The following names of constituents are well recognized: Ferrite, cementite, pearlite, sorbite, martensite,

troosite and austenite. Professor Arnold also speaks of the supposed compound  $\text{Fe}_3\text{C}$  as "hardinite."

Percy Longmuir of the National Physical Laboratory in referring to metallography has made the remarkable statement that the practical steel hardener of to-day, with his purely traditional methods, is actually in advance of the man of science.

H. M. Howe has ably dealt with the microscopic analysis of metals. Mr. Osmond in his interesting work entitled "The Microscopic Analysis of Metals," edited by Mr. Stead, states that in metallography subdivisions may be found almost analogous to those of medical science, viz.:

1. Anatomical, as it distinguishes and defines the different constituents of each alloy by observing their optical, chemical or mechanical characteristics.

2. Biological, because it enables the composition, forms, dimensions and relations of the different constituents to be determined.

3. Pathological, because it deals with the diseases of metals arising from errors of treatment and improper composition.

#### Low Temperature Experiments.

Some time ago in studying the interesting experiments of Sir James Dewar with liquid air it occurred to me that it would be of great importance to obtain the mechanical and other properties of my various alloy steels from the series produced during the last 15 years.

Practically at this low temperature pure iron has its tenacity more than doubled; its well-known ductility falls very low; its magnetic properties remain almost the same as at higher temperatures. This represents the general behavior of all the alloys excepting those containing nickel, which are less affected as regards loss of ductility, while an iron alloy containing 5 per cent. of manganese and 25 per cent. of nickel has its extraordinary ductility, about 60 per cent., still further increased, and the tenacity also largely increased. Manganese steel has its ductility lowered, but its nonmagnetic properties remain apparently unaffected.

#### Steel Castings.

This important branch of steel production is an industry which has practically sprung up within the last 40, certainly with the last 50, years. In other words, but a few years before the great International Exhibition of 1851 steel castings were practically unknown, and yet to-day it would hardly be possible for constructive engineers of any class to carry out their work without the use of steel castings.

There seems always to have been a glamour over the practice of steel casting. Probably more heartbreaking and disappointment have occurred in the exercise of this art than in any branch of steel industry; partly because those entering into the arena have been totally unaware of the many difficult conditions and problems that had to be overcome. Cast iron and cast steel have seemed to many almost the same, and only after bitter experience has their great difference been discovered. The ease with which steel could be produced on a large scale for ingots, when probably half a dozen or a dozen large ingots used up a whole heat, gave no foretaste to early workers of the extraordinary difficulties in pouring a heat of the same steel into many separate castings. The want of fluidity caused much trouble, and wasters by the score were produced. Then, too, the great contraction, double that of cast iron, which had to be dealt with, added to the difficulty of obtaining castings free from cracks, to say nothing of the apparently intense desire of fluid steel when poured into a sand mold to assume that beautiful honeycombed form so sadly familiar in earlier days.

Happily, however, many of these difficulties have been overcome, and though the industry is still one requiring more than usual care and skillful management, the satisfactory advances made during the last decade have been of the highest importance.

The great advantages derived from the use of aluminum and silicon as solidifiers have enabled most of the defects due to unsoundness to be overcome. Increasing knowledge of the analyses and qualities of the various sands and fire resisting materials used in molds has

been equally important. A range of product varying from that having a ductility almost equal to that of soft forged steel up to the hardest type is now readily obtained.

Many of the difficulties still met with would be largely overcome if the engineer would consult the steel founder when preparing his designs and patterns. Slight differences in design will insure the production of a casting in steel which could not otherwise be satisfactorily made; in other words, the steel may be of the best, the mold properly prepared, and yet all be entirely spoiled by failure to appreciate the necessity for adapting as far as practicable the design of the article required to suit the peculiar nature of fluid steel.

As an example of the difficult castings now produced my firm recently made a number of hydraulic cylinders 30 feet in length, with walls only  $1\frac{1}{4}$  inches in thickness, the contraction in the molds on this length amounting to the very considerable figure of  $7\frac{1}{2}$  inches—that is, the mold had to be 30 feet  $7\frac{1}{2}$  inches in length to produce a casting of 30 feet.

#### War Material.

This address would be hardly complete without some reference to the use of steel for war material. Much as war is to be abhorred, it has some compensations; and those who prepare weapons of offense and defense have largely assisted in the perfecting and introduction of special steels having very valuable qualities which have also been turned to good account in the arts of peace. In armor plates the advance from those of wrought iron to the modern cemented hard face type has been marvelous. Armor of to-day has a figure of merit not far from three times that of wrought iron, and this, as will be readily understood, has meant in itself a revolution in the building of war vessels. There is no question that had the vessels engaged on either side been clad with wrought iron during the recent naval engagements in the Far East hardly one would have survived the contest. We are told that but little perforation of armored parts was effected.

**Armor Plates.**—Compound plates for a time struggled hard against mild or tough steel, but it was Harvey, the American, who introduced the bold idea of applying and improving the old process of cementation to the production of armor having a hard face, practically impervious to any type of projectiles excepting those with caps. Great credit is due to him for the steps he took. His efforts were wisely fostered by the American Navy Bureau. Then Ehrensberger and Schmitz of Krupp's works, with all the wonderful resources of that great establishment at their disposal, perfected this system and improved the steel of which the plates were made to such a degree that Harvey plates in their turn had to give way to what is now known universally as "K. C.," or Krupp cemented, armor.

As an example of the great superiority of this new description of armor it may be mentioned that a 6-inch plate affords equal resistance to more than 18 inches of wrought iron. It will be seen from this what a revolution has been produced in the designing of war ships by the saving of weight devoted to protection, and this again is due to the metallurgist.

The problem of suddenly arresting armor piercing projectiles, striking in some cases with 30,000 foot-tons of energy, has not been an easy one, as will be readily understood; therefore the greatest credit is due to the firms of Krupp, Brown, Vickers, Cammell, Beardmore, Armstrong, Schneider, Terni, Witkowitz, Carnegie and Bethlehem, which have gradually brought their work to that state of perfection that an uncapped projectile can be stopped in its more than "mad career" with ruin to itself, while the plate passes successfully through this trying ordeal unperforated and with nothing more than a few face cracks. Messrs. Schneider in November last rolled a nickel-chromium steel armor plate weighing 65 tons, the ingot having been 4 feet across and 9 feet in length.

Although the price paid for such armor is high the makers well deserve their reward, as the risk and anxiety involved in the manufacture are very great.

**Projectiles.**—Having said so much for armor, what



shall be said of the latest type of projectiles, which by means of a cap has enabled this remarkable armor to be readily perforated? The difficulties attending the production of a projectile of this high efficiency quite equal those met with in the manufacture of armor. It is not a little creditable to the projectile makers in this country, who are neither nursed nor pampered by their Government, as are the manufacturers abroad, that they have met this want. In one case a 12-inch armor piercing shell was fired at a 12-inch Krupp cemented plate at a velocity of about 2000 foot-seconds, the plate being completely perforated and the projectile after passing through this trying ordeal being found in the rear of the plate in a condition for bursting.

With the complex stresses involved in such a trial, both to the plate and to the projectile, it will be seen that the problem of producing the most suitable material for the purpose is one demanding a very high order of skill and knowledge.

There still remain many problems to be solved in plate and projectile manufacture, and also in the production of steel used in modern high velocity guns, but out of chaos order is being evolved.

**Gun Steel.**—In the construction of guns carbon steel has long held its own. Naturally the risk of the gun bursting has necessitated great caution in the production of the material to be used. Special steels have been regarded with suspicion, but there is now a growing disposition to consider the question of using a special steel having higher efficiency as regards resistance to the severe stresses met with and also to erosion. Attention is also being given to the means for avoiding "streaky" steel, which in the past has given much trouble.

In order to afford an exact idea of the enormous energies which have to be dealt with it may be mentioned that a 12-inch breech loading gun has been fired in this country with a muzzle velocity of close upon 2700 foot-seconds. This means a striking energy of 42,220 foot-tons. The projectile if uncapped would be capable of perforating 44 inches of wrought iron, 34 inches of mild steel, 19 inches of Krupp cemented armor; if a capped projectile were used about 23 inches of Krupp cemented armor would be pierced. As may be imagined, the inner tubes of guns at such velocities are soon worn out; in fact, in large caliber guns an improved steel for these inner tubes is a matter much to be desired.

In addition to the well-known makers of guns and gun steel in this and other countries may be added the names of the Skoda and B&förs companies, which are also doing excellent work.

There are many other warlike purposes to which the use of steel of high quality is applied, and, generally speaking, there is room for research on all sides in this branch of metallurgy. To use the words of an American on the subject, "Progressive development of ordnance material requires continual prying with stimulated imagination." This is very true, for in this field difficulties are constantly occurring to set us thinking how to best overcome them.

### Some American Records.

In an appendix to his address as president of the Iron and Steel Institute R. A. Hadfield quotes the following data furnished to him by William R. Walker of the United States Steel Corporation:

"No. 1 Duquesne Furnace of the Carnegie Steel Company, located at Pittsburgh, Pa., has produced 1,287,381 gross tons of pig iron on one blast furnace lining.

"Edgar Thomson Furnace K of the Carnegie Steel Company, located at Pittsburgh, Pa., has produced 21,271 gross tons of pig iron in one month.

"The Edgar Thomson Rail Mill of the Carnegie Steel Company, located at Braddock, Pa., has produced 70,444 gross tons of rails in one month.

"The amount of metal tapped at the Homestead No. 3 open hearth plant of the Carnegie Steel Company, located at Homestead, Pa., is equal to a 3-inch stream of molten metal running continuously 24 hours per day for 300 days per year.

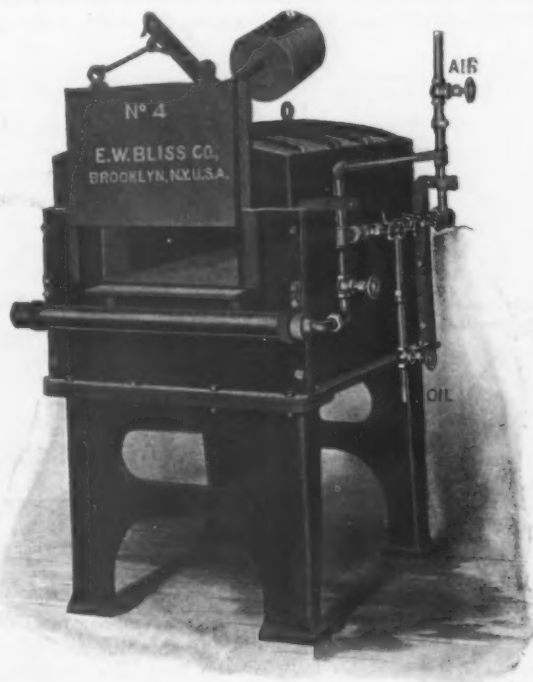
"The barb wire machines of the United States Steel

Corporation produce 2.95 miles of barb wire per minute for 24 hours per day for 300 days per year.

"Steamer Augustus B. Wolvin discharged a cargo of 10,300 gross tons of iron ore in 4 hours and 30 minutes."

### The Bliss Oil Forging Furnace.

For a number of years the E. W. Bliss Company, Brooklyn, N. Y., has made a specialty of building drop hammers and has recently added to its works a new department, so that it is now prepared to equip complete drop forging plants. One of its new products is a fuel oil burning furnace for drop forging work, which has been designed to embody a number of features found from practical experience to be desirable. It is built to avoid the wasteful use of oil and gives the best service when atomizing the oil by using air under a pressure of 15 to 20 pounds, as the heat can then be regulated to a nicety. If tool steel is being forged a slow fire is necessary to avoid burning or overheating the stock. If soft steel or iron is used the heat can safely be raised to a higher degree and an increased output secured. The installation of a compressor is somewhat expensive and if the plant is a small one a satisfactory substitute is a pressure blower giving air at about 1 pound pressure. The furnace



The Bliss Fuel Oil Burning Furnace for Drop Forging Work.

is suitable for either pressure, the only difference being in the burner.

Oil as a fuel is cheaper than anthracite coal, it avoids the annoyance of ashes and dirt in the shop, it heats faster than coal, and as the heat is uniform the danger of injury to the material by burning is minimized. Another economy in the use of oil fuel is that when the forge is no longer wanted the closing of the valve instantly stops expense; whereas with coal fuel the bed of live coal is daily wasted.

In front of the furnace a perforated pipe is placed directly under the opening. The holes in this pipe are small and run the entire length of the opening, and as streams of air are constantly flowing through the holes it serves to keep the heat within the furnace, and also acts as a cooling agent for the operator when removing heated bars and in replacing them.

Particular attention has been given to the interior dimensions of the furnace, which is made in four sizes. The opening and the interior in all furnaces are of the smallest possible size so as to avoid the wasteful use of oil, and at the same time to heat the material so quickly as to enable the forger to work constantly and not be obliged to wait for heats. The four different sizes are made to accommodate the various sizes of forgings which are most commonly made.

## The Cleaning of Blast Furnace Gas.\*

BY AXEL SAHLIN, LONDON.

The rapid development of the gas motor during the last five years has given new value and importance to the gas escaping from the blast furnace, previously often described as waste gas. This "waste gas" has now become a potential source of energy, which, rightly used and husbanded, should, together with the gas from the coke ovens supplying the blast furnaces, suffice for the carrying out of the entire series of converting and finishing processes which transform the ore into marketable steel products. The gas leaving the blast furnace carries with it a varying amount of gritty dust, which has proved a more serious obstacle to the successful operation of large gas engines than any mechanical imperfection in the construction of these engines. Successful efforts to remove the dust from the gas used in the gas engine have in a practical manner demonstrated how wasteful and imperfect have been our previous methods of utilizing the valuable blast furnace gas.

Until the appearance of the gas engine at the blast furnace plant the dust problem was, as a general rule, dealt with in a different manner by each of the three large iron producing countries. In England, in at least 90 per cent. of the blast furnace works, the dust in the gas

and the question of cleaning the gas became one of imperative importance. The generally adopted American dust catcher consists of a wide, unobstructed chamber, through which the gas passes and in which its velocity is greatly retarded. The bottom of the dust catcher is built as a hopper, closed at its lowest point by a door or valve through which the dust from time to time is removed by gravity. It required the appearance of the gas engine to compel improvements in these methods and to stop, at least partly, the waste which had been permitted to go on from year to year.

We have now learned and realize that the whole of the gas escaping from the blast furnace should be utilized for subsequent refining and finishing processes and that before being so used it should be thoroughly cleaned. By cleaning all the gas we could save one stove per furnace. (No reserve will thenceforth be necessary to maintain the capacity of the furnace during the periods of cleaning of the different stoves, and three stoves per furnace will give good practice.) The heating surface of the three remaining stoves may be made 10 per cent. smaller than hitherto, because with dusty gas the value of the heating surface will gradually decrease, whereas with clean gas it will have a permanent efficiency. The heating surface of the boiler plant may be reduced from 10 to 15 per cent. for the same reason and because the

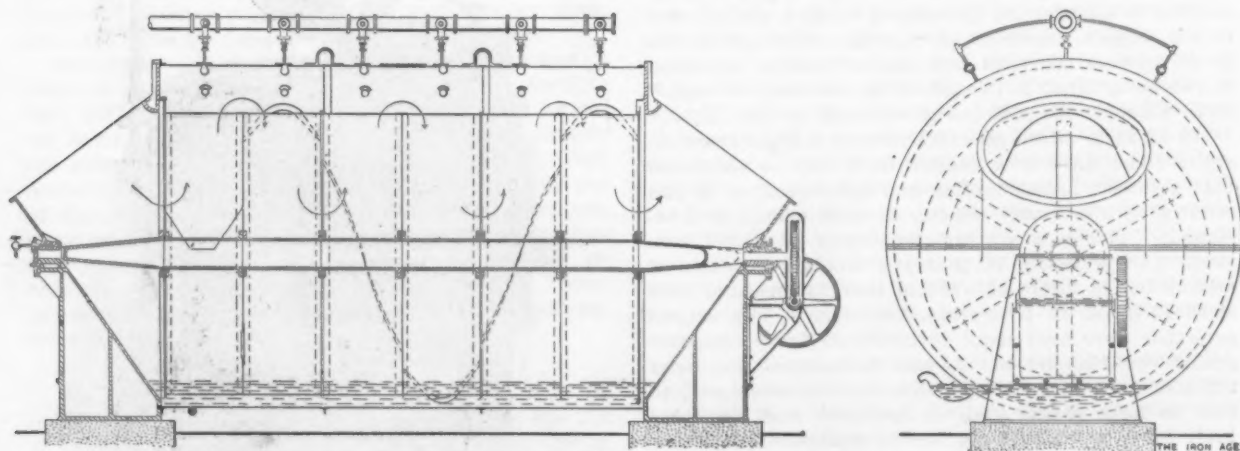


Fig. 1.—The Sahlín Revolving Gas Cleaner, Built by Julian Kennedy, Sahlín & Co., London, Eng.

was disregarded. A single downcomer carried the gas escaping from the tunnel head into an underground gas flue leading to stoves and boilers. In this flue and in the stoves and boilers the bulk of the dust was deposited. Every few months a rather long stoppage, regularly attended by subsequent more or less costly disturbances of operation, was required for the cleaning of these flues, while the cleaning of stoves and boilers belonged to the daily routine of the works. English engineers were in a position to ignore the dust problem, partly because of the customary slow driving and partly because of the clean and firm structure of the materials used. But even with these advantages stoves, and especially boilers, had often to be put out of operation, cooled down and cleaned, and the efficiency of the plant suffered.

In Germany the majority of the furnaces were equipped with a dry or wet dust catcher, consisting of a series of upright tubes of small diameter, the open bottoms of which extended downward into a common water seal. The dust was deposited mostly by centrifugal force, as the direction of the flow of the gas was suddenly changed in passing through the cross tubes connecting one chamber with the other. Usually six of these chambers from 6 to 8 feet in diameter, and often 60 feet in height, constituted the dust catcher. The collected dust was raked from the pan forming the water seal by manual labor. The gas leaving the dust catcher could not be considered properly cleaned.

Since the discovery of the Mesaba mines American blast furnace engineers have been compelled to use a burden containing from 50 to 100 per cent. of dust fine ore,

necessity for periodical cleaning of the boiler settings will disappear. The repairs to the boiler plant will be reduced as the strains due to frequent cooling of the boilers are avoided. The labor force previously constantly employed in cleaning stoves and boilers may be dispensed with. The more perfect combustion will reduce gas consumption and liberate for use in other departments a considerable percentage of gas hitherto wasted. The percentage of gas thus saved may be estimated at about 20 per cent. of the volume burned in stoves and boilers. The success of blast furnace operations depends entirely on the regularity and uniformity of conditions affecting the furnace. Uniform fuel gas will give uniform heat and uniform power and will add increased efficiency to the furnace.

Granting, then, that blast furnace gas should be cleaned before being burned, we proceed to consider the process of cleaning from two points of view—the degree of purity reached and the cost of reaching it. It is the removal of the last fraction of a gram of dust contained in a cubic meter of gas which largely adds to the expense of cleaning. For stoves, boilers, kilns, furnaces, &c., such a small quantity of exceedingly fine and buoyant dust is no detriment, as it will pass off with the products of combustion through the smokestack. A gas containing 0.3 gram per cubic millimeter or less is sufficiently clean for these purposes. For the gas engine, on the other hand, the gas can never be too pure, and the removal of the last tenth of a gram, though expensive, will pay for itself in longer life and decreased repairs to the expensive engines.

The cleaning of the blast furnace gas should take place in three stages, as follows: The preliminary dry

\* Paper presented at the May, 1905, meeting of the Iron and Steel Institute.



cleaning, which does not involve extra operating expenditures; the wet cleaning, to fit the entire quantity of gas for use in stoves and under boilers, in roasting kilns, furnaces, &c.; the special cleaning for purifying part of the gas for power purposes.

#### Dry Cleaning.

The gas should be removed from the blast furnace as much as possible symmetrically around the circumference of the furnace, so as to avoid an excessive flow of gas in any one direction. The use of four gas uptakes, which, curving downward, should unite into one main downcomer, is to be recommended; this downcomer to enter the dust catcher tangentially and near the bottom of the chamber. It is a mistake, from the point of view of cleaning, to make the downcomer too wide. It should be designed so as to cause the gas to flow with an average velocity of from 25 to 35 feet per second. The dust

#### Wet Cleaning.

The second cleaning should be effected by means of water. Experience has proved that the fine dust settles most readily on cool and moist surfaces. The passage of gas through open chambers, even though profusely sprayed with water, has not proved effective.

Inventive effort has during the past five years been directed toward providing gas cleaning apparatus, which may be grouped into three classes: Stationary cleaners, or scrubbers; rapidly revolving or atomizing machines, and slowly revolving or fresh contact cleaners.

**Stationary Cleaners.**—These consist of chambers, from the top of which sprays of water, distributed over the entire section of the chamber, descend. The water is arrested by a number of grids or porous masses of material with numerous interstices. Iron bars—rolled and cast—tangled wire, coke or wooden slats, have all been used with success as filling material or grids. The gas enters the apparatus from below the grids and ascends, meeting the sprays of water falling from above through the innumerable interstices in the obstructing grids or masses, to the wet surfaces of which the dust adheres, only to be washed away by the falling drops of water. The Zschocke cleaner is a well designed type of such apparatus. It is claimed that the gas leaves this ap-

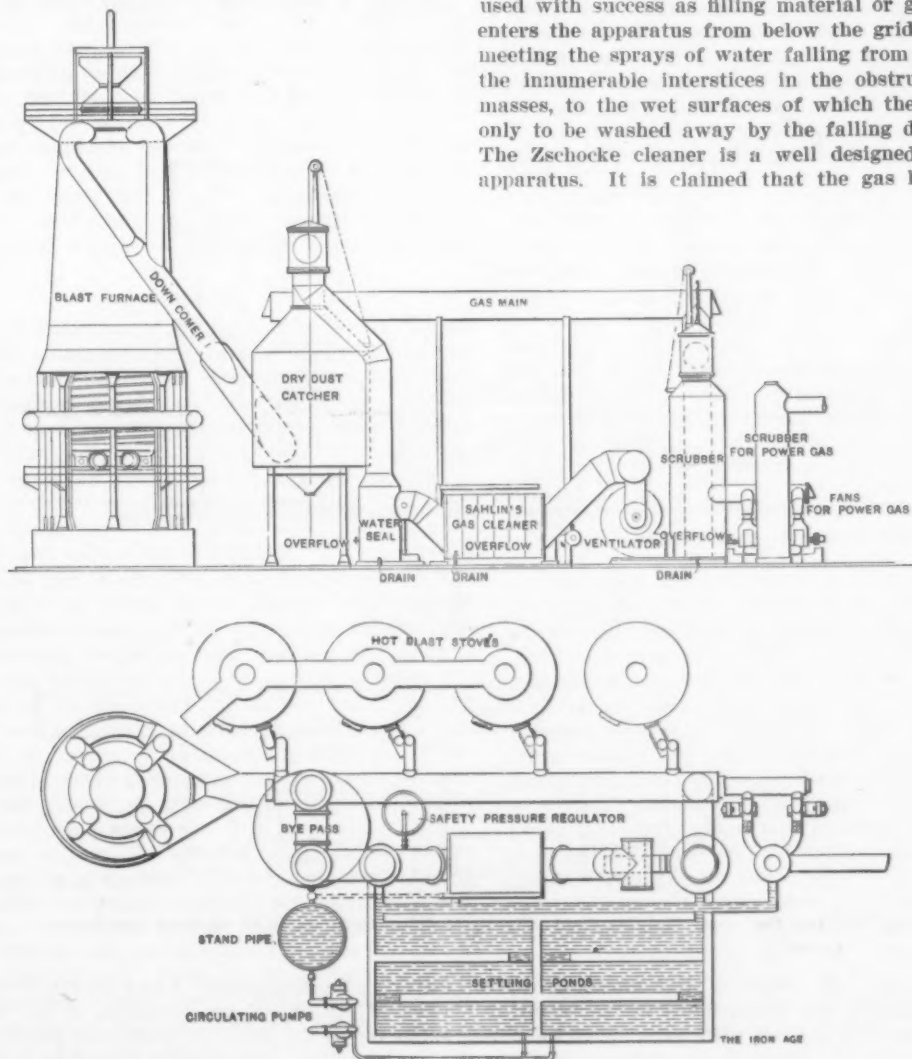


Fig. 2.—A Cleaning Plant to Care for the Entire Volume of Gas from One Blast Furnace.

catcher should be built in the shape of a vertical cylinder with conical top and bottom; it should have a diameter of not less than four times that of the downcomer. The delivery opening from the dust catcher should be placed centrally at the top of the same. The gas will by this arrangement, on entering the dust catcher, be given a rapid swirling motion, and the two powerful and inexpensive agents, gravity and centrifugal force, will combine to deposit in the dust catcher all the heavier particles of dust. According to the nature of the materials charged the dry dust thus collected may or may not be worth briquetting and recharging.

The gas leaving a well designed dust catcher may still contain from 2 to 8 grams of dust per cubic meter, depending largely on the character of the ore employed and the rate of driving of the furnace.

The whole volume of gas should next be submitted to the second stage of the cleaning process.

paratus with from 3.0 to 1.4 grams of dust per cubic meter.

**Rapidly Revolving Machines.**—The earliest form of the rapidly revolving or atomizing apparatus was, as a matter of course, the fan. Having been in use for generations, it was at once available as a mechanically perfect tool. The water injected into the fan, together with the gas, was forcibly dashed against the casing, removing the dust. A modification of the fan is the Thelsen apparatus,\* which provides a forced contact between gas and spraying water driven against a cylindrical envelope by fan blades set at oblique angles to the axis of rotation. There are probably no more effective contrivances known to-day for elimination of the last fractions of a gram of dust per cubic meter than a properly designed and rapidly revolving fan or a Thelsen apparatus. But the good work is not done cheaply, as the power consumed for re-

\* Described in *The Iron Age*, August 18, 1904.

volving the blades increases greatly when the water sprays are put in operation. This class of apparatus is, therefore, most suitable for thoroughly cleaning the portion of gas used for generating power.

*Slowly Revolving Apparatus.*—The considerable power required to drive rapidly revolving water sprayed fans on the one hand, and the difficulty of insuring a thorough and uniform cleaning of the grids or checkers of the stationary apparatus on the other hand, led to the design of slowly revolving gas cleaners, which are particularly suited for the second, or wet, cleaning of the entire volume of gas produced by the furnace before it is admitted to the stoves, boilers, kilns or to the fans which finally prepare it for the gas engines.

The Bian apparatus is the earliest form of this type and has proved very effective. It consists of a horizontal cylindrical casing, through which the gas is passed from end to end. In the axis of the cylinder revolves slowly a shaft, to which are bolted a number of circular disks of perforated plates of a diameter but little less than the inside diameter of the casing. The gas is therefore in its progress compelled to pass through the perforations in the disks. Between the perforated disks extend from the outer envelope annular deflecting plates, which compel

riveted together and solid plate disks carrying at their circumference similar angle rings. Between the angles of the spider arms and those of the disks are bolted perforated plates, forming the envelope of a drum. The oblong perforations are wider at the end of the cylinder where the gas enters and gradually narrower toward the discharge end. Between the outer shell and the inner revolving drum is formed a horseshoe shaped space, widest at the top. Closely behind the rim of each spider this space is divided by plate diaphragms riveted to the outer shell and practically closing the open area between shell and drum. To the angle rings of the frame, supported by the spider arms and by the disks, are bolted a series of spirally bent flat bars, or scrapers, which closely approach the bottom of the shell. Near the gas inlet is riveted, to the lower part of the shell, a water sealed discharge opening. At the bottom of the shell, near the gas entrance, a drain cock or sludge valve is provided for

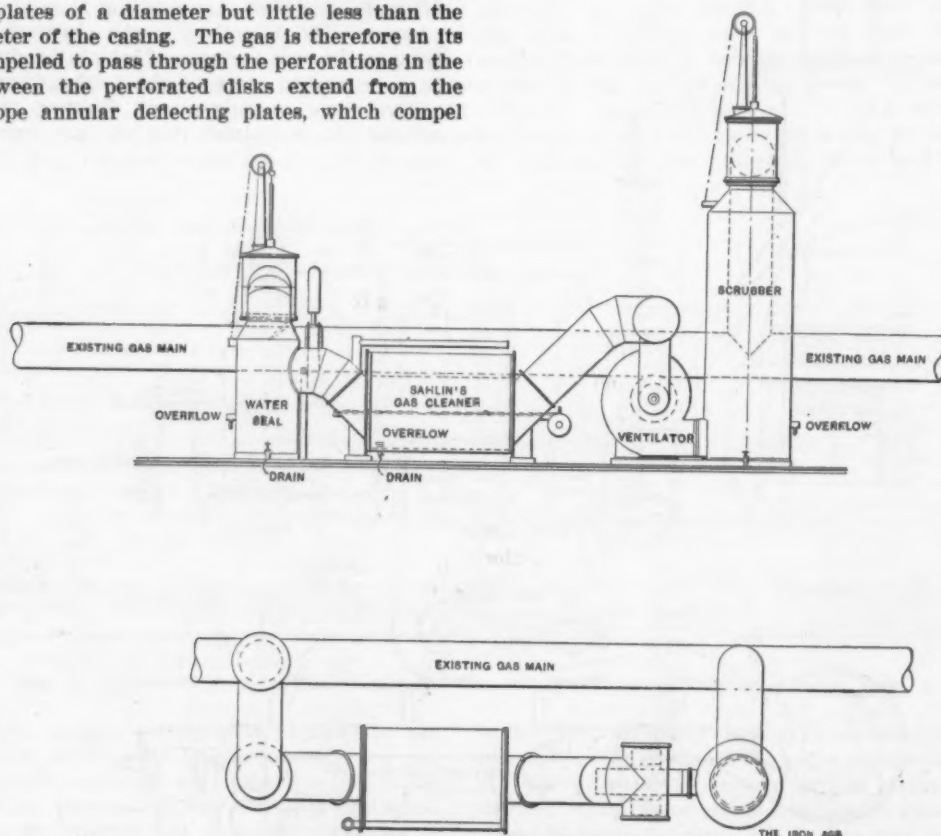


Fig. 3.—A Secondary Cleaning Plant, Slightly Modified, to Attach to an Existing Gas Main.

the gas to approach the center of the apparatus after each passage through the perforations in the revolving disks. The outer shell is filled with water up to the bottom of the central shaft. In revolving the perforations in the disks are therefore dipped into water and thoroughly washed for every revolution of the apparatus, and ascend from the bath covered with thin films of water. The dust which settles on the bottom of the apparatus is from time to time drained off through suitable sludge valves. This apparatus is effective and requires but little power to slowly revolve the central shaft and the disks fastened thereon.

With the view of securing larger capacity of each apparatus—that is, a larger area of perforations in proportion to the diameter of the apparatus—a better and more continuous wetting of the perforated surfaces and a more automatic and constant removal of the dust—my firm has designed a new style of slowly rotating gas cleaning apparatus, which has been named the Sahlin revolving gas cleaner, shown in Fig. 1.

It consists, like the Bian apparatus, of a horizontal cylindrical shell. Parallel with the axis of this shell, but somewhat below the center of the same, is placed a horizontal shaft. On this shaft are fitted, alternately, spider arms supporting rings of double 3-inch angle iron

emptying the apparatus. Along the top of the shell three rows of sprinklers are arranged, so as to deluge the entire top of the revolving perforated plates with a dense spray of water. The drum is turned by worm and worm gear through a belt pulley driven from the ventilator described below.

When gas enters the apparatus through the head of the outer shell it is admitted into the drum between the spider arms supporting the first angle iron ring, but is then confronted by the first solid disk. The only passage offered is through the narrow and dripping perforations of the drum. In passing these the gas is met by the profuse spray from the sprinklers. It is at the same time spread out into a thin sheet in the horseshoe shaped space between the two cylinders and advances outside and beyond the first revolving disk until met by the first horseshoe shaped diaphragm, which prevents further progress and compels the gas again to enter the interior of the drum beyond the first disk. Passing through the openings in the second spider wheel, it is again compelled to flow outward through the perforations in front of the second disk, and so on, the gas passing forward and back through the perforated envelope, now spreading itself into a thin layer, now contracting itself into a cylindrical column, and continuously exposed to the intense



spray from the sprinklers. The gas has, of course, to turn an angle of 180 degrees every time it passes through the perforations. It is finally delivered through the discharge opening, which corresponds to the opening of admission, at the opposite end of the shell. The dust is settled in the water at the bottom of the shell and is moved by the spirally bent scrapers toward the inlet end, where it is discharged automatically through the water sealed overflow.

As the areas of drum, perforations and horseshoe shaped space are all very large compared with the section of the downcomer, the velocity of the gas in passing through the apparatus is greatly reduced. The resistance offered by the apparatus is, therefore, insignificant, even though the entire volume of gas produced by one furnace is passed through a single apparatus. The perforated drum is revolved about six reversions per minute, requiring less than  $1\frac{1}{2}$  horse-power, which power is transmitted by a belt from the shaft of the ventilator. It has been found that whether a stationary or slowly revolving apparatus is used for the second cleaning, the tunnel head pressure must be assisted by a ventilator to insure an even flow of gas. This ventilator is, however, by no means as great a consumer of power as would be water sprayed cleaning fans or atomizers. A ventilator passing 40,000 cubic feet of gas per minute (equal to about 70,000 cubic meters per hour) against a head of 2 inches water column requires only about 35 horse-power.

#### Safety Device.

If for any reason, such as the hanging of the furnace or the sudden stoppage of the blowing engine, the flow of gas from the furnace should cease or be reduced, there is with all forms of gas cleaning apparatus a danger that air may be drawn into the apparatus and gas tubes, where the mixture of gases formed may, in unfavorable circumstances, cause serious explosions. To prevent the possibility of this I recommend a very simple and effective device, consisting of a small gasometer having a diameter of 8 feet, with a lift of 6 inches. This gasometer is so balanced that it will drop when the pressure inside the piping falls to  $\frac{1}{4}$ -inch water column. The interior of the gasometer is connected by a pipe with the dry dust catcher. An arm projecting from the top of the gasometer connects with a switch in the circuit, carrying the electric current to the motor driving the ventilator and cleaner in such manner that when the gasometer drops the current is broken and the motor stopped. When the returning pressure in the dust catcher causes the gasometer to rise the circuit is automatically closed and the cleaning apparatus started.

A general outline of a cleaning plant for the entire volume of gas from one blast furnace is shown in Fig. 2. The gas leaves the furnace through four uptakes placed at an angle of 90 degrees. These join into one downcomer, which delivers the gas in tangential direction into a cylindrical dust catcher. From the top of the dust catcher the gas passes through one of two mushroom valves. The valve nearest to the stoves connects the dust catcher direct with the gas main and is opened only in case of repairs to the gas cleaning plant. The second valve connects the dust catcher with a water seal, from which the gas flows into the Sahlin gas cleaner described above. From this gas cleaner it reaches a ventilator, which delivers the now sufficiently clean and cooled gas into the bottom of a dryer. By closing the drain pipe and admitting water this scrubber or dryer may be changed into a second water seal, effectively isolating the cleaner. Crossbars inside the dryer carry a column of coarse coke. In passing through this the gas is freed from the bulk of the water which may be mechanically carried from the second or wet cleaning. At the top of the dryer a mushroom valve again admits the gas into the general gas main. There is no spare or reserve provided for this simple wet gas cleaning plant. The damage caused by occasionally using for short periods gas direct from the dust catcher, as now is being done continuously, is not sufficient to justify an increased investment in duplicating the plant. The power required for the second stage of cleaning of 40,000 cubic feet of gas of a temperature of 20 degrees C. is, as above stated,  $36\frac{1}{2}$  horse-power, to

which must be added 8 horse-power for pumping of cooling water.

#### Gas for the Power Plant

is drawn from the clean gas main and is passed through one of two electrically driven fans sprayed with water and discharging into a second smaller dryer, whence the gas, now dust free, practically speaking, is sent to the engines. The size of this plant depends on the quantity of gas required for power purposes. A fan cleaning 10,000 cubic feet per minute and using 8000 gallons of spraying water per hour requires about 65 horse-power and will supply gas engines of from 5000 to 6000 horse-power. The pumping of spraying water will require about 3 horse-power additional. The cooling water used in the cleaning processes is delivered into double settling and cooling ponds and is thence lifted by centrifugal pumps into a standpipe or water tank, from which it is returned by gravity to the cooling plant. On top of the tank may be arranged trays for additional cooling of the water.

The secondary cleaning plant, slightly modified, as shown in Fig. 3, may be attached to any existing gas main. A slide valve is inserted into the gas main, and on either side of this valve is placed, on top of the main, a mushroom valve. The mushroom valve on the side nearest the furnace will connect directly with the water seal and the Sahlin gas cleaner. The mushroom valve on the side away from the furnace will return the gas directly from the dryer into the existing gas main. Should it be necessary to stop the gas cleaning plant, the slide valve is lifted and the mushroom valves are closed, the gas, according to present general practice, passing directly from the dry dust catcher to stoves and boilers or to the special cleaning plant for the gas engines. Interruptions in the working of the secondary cleaning plant will, however, be infrequent, as the simplicity and solid construction of the plant will reduce repairs to a minimum.

#### Waterbury Brass Interests.

The brass manufacturers of Waterbury, Conn., and the Naugatuck Valley generally, are very busy, though in one or two instances the statement is made that the demand is not quite so brisk as it was during the winter. The plants are running their normal ten hours a day, with double shifts in some departments, which is not unusual. Several of the large plants are building additions, besides the general increase in manufacturing capacity which is nearly always in progress. The Waterbury Brass Company is about to extend its rolling mill. Other Waterbury plants of the American Brass Company are making general improvements, as is customary at this season. The Scovill Mfg. Company is erecting a four-story building, 50 x 250 feet, to be devoted to general manufacturing. The Waterbury Mfg. Company completed large additions last fall. The American Brass Company is doing no building at either the Torrington or the Ansonia works. The manufacturing interests of Waterbury will be greatly benefited by very extensive improvements to the railroad facilities of the city, which are not of the best. The New York, New Haven & Hartford Railroad is working out a comprehensive plan, which includes large freight yards and the double tracking of the Naugatuck Division, which carries the bulk of the city's freight. The city is growing prodigiously fast and can now boast of more than 70,000 people who are practically all supported by manufacturing industries. With the increased freight facilities an additional impetus will be given the community. The double tracking of the Naugatuck Division will also be a pronounced benefit to the towns of the upper valley.

At Pittsburgh last week, John F. Wilcox, consulting engineer, won a suit against the Semet-Solvay Company, Syracuse, N. Y., securing a verdict for \$35,000. Mr. Wilcox had a contract with the company calling for five years' employment at \$12,000 a year. He was partially paralyzed after working 10 months, and it is alleged the company refused to give him work. He sued to recover \$46,945.88, claimed to be due under the contract.

### Latest Customs Decisions.

The Treasury Department has given official notice that it will not abide by the recent decision of the United States Circuit Court in the case of the Crucible Steel Company, in which it was held that sheared steel shapes are not liable to an additional duty of 1 cent per pound. On the contrary, the Secretary of the Treasury orders that the issue be carried to the Federal Circuit Court of Appeals, where the Government will do its utmost to prove that the shapes are liable to the extra duty under the terms of the Dingley tariff law. Until the question is settled finally one way or the other, importers will be under the necessity of paying the additional cent per pound on the shapes. Already many importers' protests

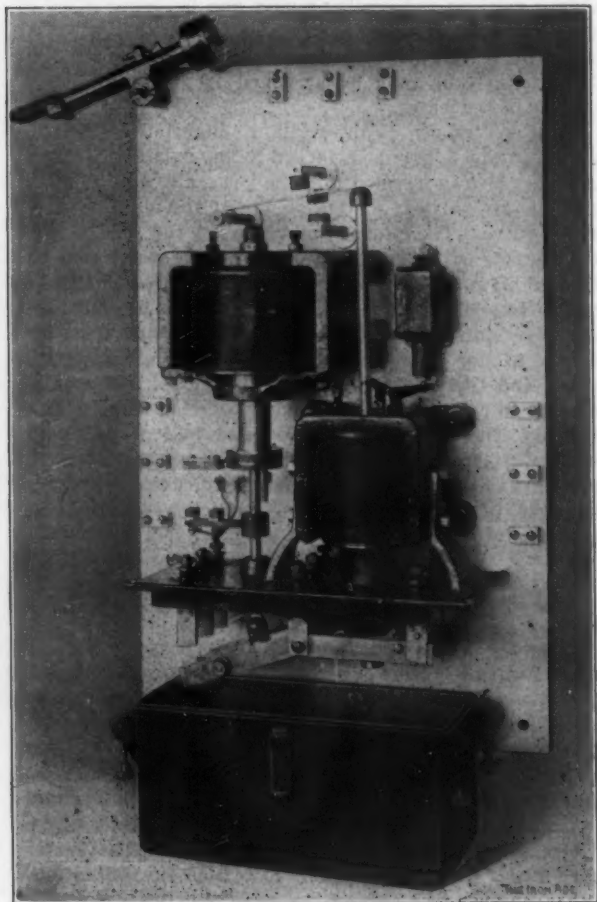


Fig. 1.—An Automatic Starter for Induction Motors, Made by the American Electric & Controller Company, New York.

objecting to the extra rate have been filed with the Board of United States General Appraisers. The protests will remain on the board's suspended files until the test case in the courts has been decided.

James B. Reynolds, Assistant Secretary of the Treasury, has made several decisions the past week extending the drawback regulations. The rate of drawback on tin cans manufactured by the Standard Oil Company from imported tin plates and solder containing imported lead has been extended so far as applicable to cover exportation of "two imperial gallon" cans. Another decision affecting the Standard Oil Company was made on Monday by Secretary Shaw. The regulations fixing a rate of drawback on 10-gallon drums manufactured by the company with the use wholly of imported terne plates were extended so far as applicable to cover round drums of 5 gallons capacity manufactured from imported terne plates.

The Treasury regulations fixing a rate of drawback on iron pulleys manufactured by the Yale & Towne Mfg. Company, with the use of imported chains, have been extended to cover exportations of extra imported chains not attached to pulleys, after they have been smoothed by tumbling, stretched to the correct pitch, gauged to the proper mesh and all bad links removed and replaced by new ones.

### New Alternating Current Controlling Apparatus.

Several months ago the American Electric & Controller Company, New York City, was organized, its first product being an automatic controller known as the rheocrat. By means of this controller, which was described in *The Iron Age*, December 8, 1904, variable speeds may be obtained from ordinary direct current constant speed motors. The scope of the work which this company now engages in has lately been increased by the addition of a line of controlling devices for alternating current motors and lighting systems. The main aim of these devices is to afford means of controlling alternating current distribution from a distant point, and to eliminate human judgment in the time consumed for the proper manipulation of the switches.

Heretofore it has been necessary, where independent control was desirable, to carry from the power house inde-

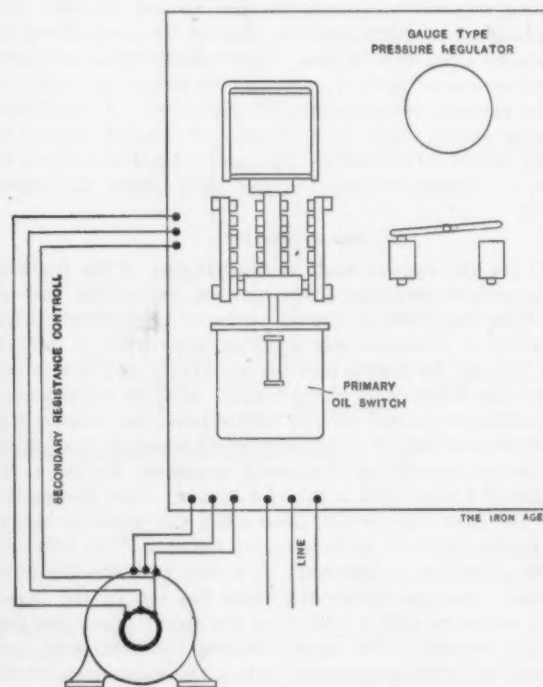


Fig. 2.—Diagram of a Starter and Connections for a Slip Ring Type of Induction Motor.

pendent circuits of heavy wire, double or triple according to the phase, to the various motors, transformers and other apparatus. To do away with such extensive wiring a line of electrically operated switches has been brought out. The switches are actuated by solenoids, are of the oil break type, designed for any potential and current carrying capacity, and may be either in the open form shown in the accompanying half-tones or inclosed in a hermetically sealed case. They may be installed any distance from the center of control and operated from this center by a simple push button or snap switch over a single line of small wire for actuating the solenoid.

Fig. 1 shows an automatic starter and speed controller for induction motors. The starter includes an auto-transformer not shown in the engraving, which may be placed on the back of the panel or elsewhere if preferred and is designed for starting and stopping induction motors of the squirrel cage type. The apparatus is shown in the engraving in the position occupied when the motor is running. At the upper left hand corner of the panel there is a float switch which acts at the proper time through a small relay at the right of the large upper solenoid and trips a latch causing the oil main switch to open, at the same time leaving the circuit ready for starting again.

To start the motor the large upper solenoid is first energized, which lifts the plunger and rod. The latter throws the auto-transformer switch and simultaneously cuts off the current in the solenoid, allowing the plunger



to descend slowly by gravity, being retarded by a dash pot. In the meantime the transformer switch remains closed for a time sufficient for the motor to attain full speed. The plunger having fallen to its lowest point makes the connection which energizes the lower solenoid and closes the oil main switch across the line, throwing out the transformer switch by the same movement.

The starter for the slip ring type of motor, shown diagrammatically in Fig. 2, is similar in appearance, but the plunger of the large upper solenoid carries a cross arm which makes sliding contact with a straight line set of contacts connected to grid resistance in the circuit of the motor secondary. In this starter the lower solenoid shown in Fig. 1 is dispensed with. A device may be added to this type of starter which will hold the cross arm plunger at any desired point along the row of contacts, making it act as an automatic speed regulator as well as a starter.

Fig. 3 shows an automatic oil switch designed for 100 amperes or less to control three-phase current. The solenoid is actuated by a push button or small snap switch located wherever most convenient, the main switch being, of course, on the main line. This switch may be used for motors of small horse-power and constant speed or for lighting circuits or any device where time is not a factor in placing the apparatus controlled directly across the line.

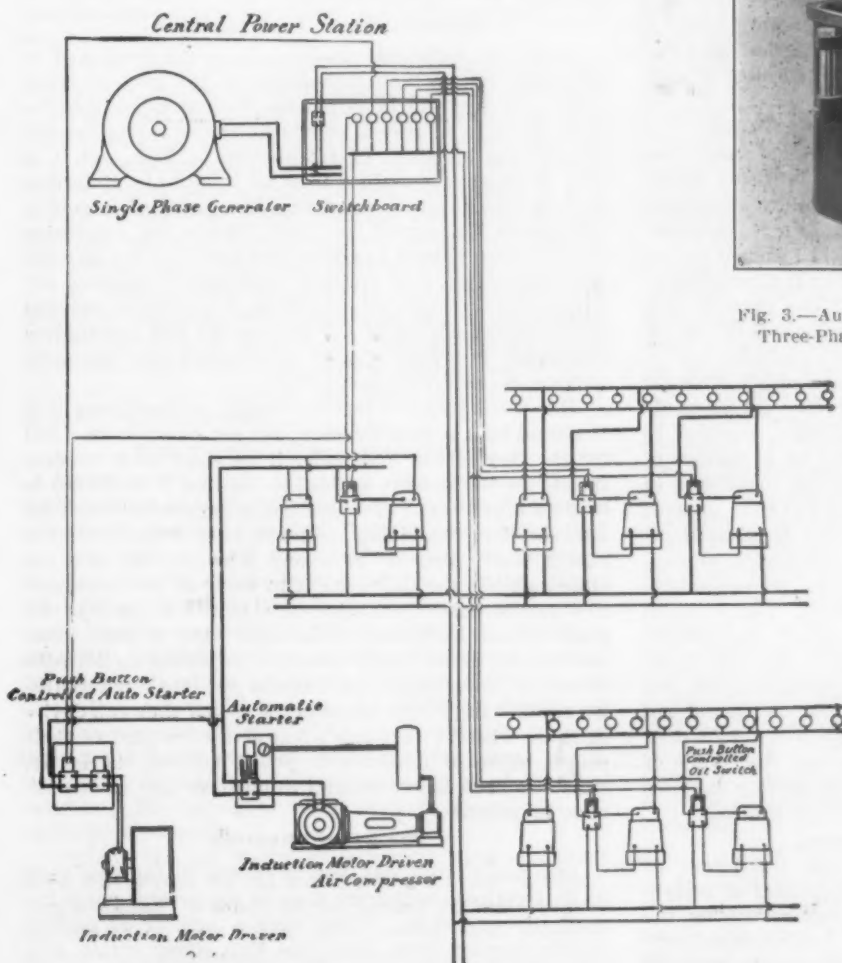


Fig. 4.—An Alternating Current System Embodying Typical Applications of the New Controlling Apparatus of the American Electric & Controller Company.

Fig. 4 outlines an alternating current system of distribution for both power and lighting, where the applications above mentioned have been worked out. Beginning at the top there is shown a single phase generator switch board supposed to be located in the central power station; directly below and to the right are several transformers in connection with lighting systems controlled by switches of the type shown in Fig. 3. To the left are two more transformers similarly controlled but through

which current is passed to induction motors. One of the motors is shown driving an air compressor, this being controlled by an automatic starter of the form shown in Fig. 1. To the left of this is a motor driven blower which is controlled by an auto-starter push button control, this being of the form shown in Fig. 3. At the lower right hand corner of the diagram are shown push button control oil switches for transformer lighting circuits.

#### Proposed Consolidation of Independent Sheet and Tin Plate Mills.—An informal meeting of a number of

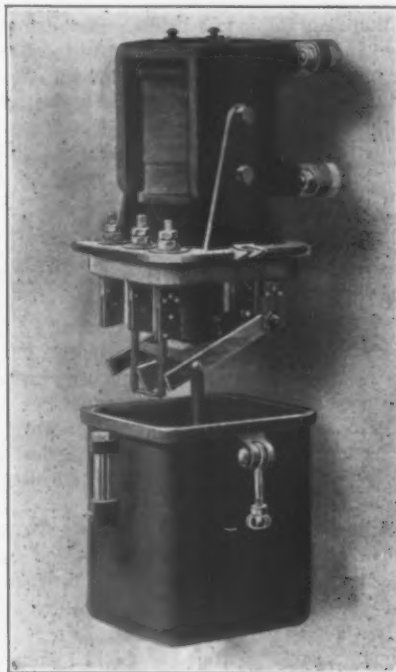


Fig. 3.—Automatic Switch for Controlling Three-Phase Circuits from a Distance.

independent sheet and tin plate mills was held in the rooms of the Colonial Trust Company, Pittsburgh, May 12. The meeting was called at the instance of Eugene S. Reilly and M. B. Kelly of the American Steel Company, Park Building, Pittsburgh, who recently sent out requests to the independent sheet and tin plate mills asking for options on their plants, stating it was their intention to buy them outright and for cash, if prices named were satisfactory. The meeting was fairly well attended, owners of 156 hot sheet and tin plate mills being present. E. S. Reilly was chairman and M. B. Kelly secretary. It developed at the meeting that very few concerns had given options on their plants, preferring to find out first what the movement meant and whether the offers made to buy their plants for cash could be put through. The matter was talked over and practically all present agreed to give options on their plants, with the understanding that they were to be paid for in cash. It is said that a number of companies value their plants on the basis of \$50,000 to \$60,000 per hot mill. Another meeting is to be held at an early date, or just as soon as the options have been given. It is reported that a steel plant is to be purchased, but this has not been confirmed.

## Labor, Foreign Commerce and Railroad Questions.\*

BY D. M. PARRY, INDIANAPOLIS, IND.

### Individualism versus Socialism.

Before proceeding to a brief consideration of the labor question I wish to make a few statements respecting the tendency toward socialism which at this time is being strongly manifested in many ways. The socialistic party last fall cast nearly a half million votes, a remarkable development in strength, and organized labor, composed of over two million employees arrayed in opposition to individualism, continues, according to reports of its officials, to increase its membership. The growth of an avowedly socialistic party and of organized labor, with its present creed, is certainly a sinister fact to all loyal citizens who understand and appreciate the importance of individual liberty. But while the existence of these organizations is indicative of a serious defection from the individualistic principle by certain classes, yet I believe that a still graver portent of coming evil is to be seen in the socialistic trend of the thought of the general public as reflected by the press, by public men and by recent legislative enactments. A notable speaker recently declared that the country had reached a stage in its history of "public clamor against capital." This may have been stating the situation too strongly, but there is no question that thousands of well-meaning citizens have become enamored of socialistic remedies for real and imaginary evils in the State. That the greatest question which the nation must eventually face is that of maintaining individualism against internal enemies is constantly becoming more discernible.

### Government Ownership of Public Utilities.

That form of socialistic endeavor which seeks Government control of capital by purchase is better stated, perhaps, as an effort to obtain the public management of capital rather than its ownership. It is supposed, however, by its advocates that the debts incurred by the Government would ultimately be paid by it through profits derived from its enterprises. At the present time efforts for this kind of socialism are limited to the acquirement by the Government of public utilities.

Attempts in the line of municipal ownership have for the most part resulted unfavorably to the claims made by its advocates. For example, legislative sanction to dispose of municipal plants was asked by a number of small towns in Indiana this year, and the experience in some of the larger cities of the country has gone to show that direct control of municipal utilities is undesirable, if not impracticable. The real facts concerning municipal trading in Europe are not such as to give encouragement to the movement in this country. But common sense as well as past experience is against the Government ownership of public utilities. Evils have no doubt developed in the private control of public utilities, but surely in the effort to avoid these evils we should not bring down upon ourselves evils a hundred fold worse. To say that the evils that do exist are not susceptible of remedy without resort to Government ownership discloses a hasty and imperfect consideration of the problem.

### Socialism by Confiscation.

While the enlargement of the scope and power of Government by the purchase and management of certain enterprises has found considerable support among the people, yet I believe the sentiment favorable to socialistic measures involving the confiscation of profits and the limitation of private management of capital is the more widespread and dangerous. Without making special reference to the aim of the avowed socialists to bring about the millennium through undisguised confiscation, we have organized labor and its sympathizers supporting the idea that organizations of men may dictate to a large extent the management of enterprises which they do not own. Besides assuming to say how much wages the employer shall pay and how he shall manage his capital in other respects, the union also presumes to deny

the right of the individual to the full control of his own labor, determining for him the rate of wages for which he shall work, the number of hours he shall employ himself and the maximum amount of daily output he shall produce. As eight-hour and anti-injunction legislation is designed to assist the unions in the accomplishment of these objects, these measures fall under the classification of socialistic attempts by confiscation. Still another illustration of this kind of socialistic propositions, and one which does not proceed from organized labor, is the pending national legislation to have the Government fix railroad rates.

It was Macaulay who prophesied in effect that the masses of the American people would in the course of several generations use their right of suffrage to confiscate all wealth in the name of the State. This prophecy certainly places a low estimate on the moral perceptions of the common people and displays a woeful lack of faith in the ability of men in general to govern themselves. But while the prophecy is rightly to be regarded as absurd, yet there is no question that there are elements in our population that are attracted by the proposition of enriching themselves through the ballot box. It is said that men vote in accordance with their interests, and some men doubtless construe it to be for their interests to vote for confiscation. But I am confident that such men are in the small minority. I prefer to believe that the greater number of those who favor socialistic measures do so from an honest conviction that these measures would be beneficial for the common weal.

### Preservation of Individualism.

Since the socialistic tendency is to be attributed to ignorance rather than dishonesty on the part of many voters, the problem of protecting individualism resolves itself down to a problem of educating the voting masses. Though the standard of intelligence be high, yet it is folly to expect the right side of an issue to be victorious if those who advocate the wrong are permitted largely to monopolize the ear of the jury. Hence the conclusion that in order to keep the American public in the straight and narrow path of political rectitude it requires not only a great common school system, but also the untiring and ceaseless efforts of the substantial and law-abiding citizenship in behalf of good government and the maintenance of American institutions.

Our Government is founded largely on the theory that it should be a good policeman, but not much more. But for the very reason that under it we enjoy such freedom should we be the more zealous to see that it continues to be a good policeman and does not become something else. Because the law-abiding elements, busy with their own affairs, leave politics to others who perhaps are not quite so busy, the Government in many of our communities has become a protector of vice and a machine for graft as well as being a policeman. And if these same law-abiding elements and busy men of affairs do not wish to see the Government also blossom out into a paternalistic meddler in private business the sooner they can devise methods whereby they can wield at least a part of their proper share of influence in public matters the better. What we need is less politics in business and more business in politics.

### The Labor Situation.

Organized labor was less strenuous in the past year in its socialistic endeavors than in the several years immediately preceding. There were a number of notable strikes, among them being the Fall River cotton mill strike, the so-called "beef strike," the strike of the employees of the Interborough Rapid Transit Company of New York and the present sympathetic strike of the teamsters in Chicago. Smaller strikes were quite numerous, but on the whole these efforts to fix arbitrary wages and hours by demonstrations of physical power were less in number and less offensive to a proper regard for law and order. This is not saying that the rights of individuals were not at times ruthlessly trampled upon or that the laws were not occasionally flagrantly ignored. But there was unquestionably less cause for complaint than for several years. I am sure that all the friends of good government and of labor itself will gladly give or-

\* Extracts from the Presidential Address at the tenth annual convention of the National Association of Manufacturers, Atlanta, Ga., May 16, 1905.



ganized labor full credit for this improvement in its record. It cannot be expected that complete reformation can be worked in the methods and theories of organized labor in a few months, or even, perhaps, in a few years, but if steady progress can be made toward such reformation not only are all the people to be congratulated, but particularly that portion of the people belonging to organized labor.

The strikes of the year were almost uniformly failures from the union standpoint. Thousands of strikers suffered the loss of employment because of the hiring of independent labor to take their places, and the unions themselves in many instances lost what control they previously had over the industries involved. The open shop was the outcome of most of these struggles. In fact, the open shop movement made extraordinary progress during the year. At a low estimate fully 1500 concerns employing labor changed from the closed to the open shop. The movement was greatly assisted by several notable court decisions in which it was held that closed shop agreements were illegal and void. The courts have never, to my knowledge, upheld the closed shop, and I do not think they ever will. They will not do so, at any rate, until the Constitution of the United States is radically changed.

#### **Eight-Hour and Anti-Injunction Bills.**

The efforts of organized labor to secure the passage of laws abridging individual freedom of action met with complete failure at the national capital during the recent session of Congress.

Besides being unsuccessful at Washington, organized labor failed in a number of its attempts during the winter to secure socialistic laws from various legislatures that were in session. This was due to the aroused activity of manufacturers and employers in these States, and while I cannot go into detail on this work, yet it is well enough to say that much progress was made in this direction, and that it is my belief that the time is fast approaching when those who believe in the perpetuation of the individualistic character of our institutions will be able to use their power effectively in respect to State as well as national legislation. The local associations have been found to be very efficient instruments in legislative work, both national and State, and particularly in State legislative work.

#### **Reformation of Organized Labor.**

Standing for certain ideas and ends, organized labor might become of much benefit to labor. With its present objects and policies, however, there is no question that it works immeasurably more harm to the best interests of labor than it accomplishes good. It preaches disrespect for law, inveighs against the militia and the courts, wages warfare on industry, denies industrial training to the youth, limits individual output and conspires in various ways to injure or punish those who will not obey its rule. But, above all, it seeks to overthrow individual initiative, the one thing to which more than to any other is to be attributed our high material development. It is thoroughly saturated with the socialistic creed that the individual has no rights which man in a collective capacity need recognize.

Perhaps the day is gradually coming when organized labor will realize the fatal errors it is making. Current events appear, in fact, to be forcing its reformation. Sooner or later it must see that it cannot make headway against the individualistic character of our institutions. Let it abandon its closed shop warfare and recognize that the workman cannot be converted into an automaton to do its bidding. Let it encourage self-reliance and self-responsibility in the workman, granting him the right to work where and for what he pleases. Let it seek to uplift labor by fostering its education and its proficiency and assisting it in securing employment by legitimate methods. Let it become a servant and not a tyrant over labor, and it will rehabilitate itself in the eyes of all loyal American people.

But so long as it persists in its present ruinous policies it must be opposed. There is no other alternative for those who believe in the perpetuation of individualism. That unionism as at present conducted is a grave menace

to the nation is apparent from a moment's consideration of its numerical and financial strength. The membership of the American Federation of Labor is at present 1,750,000. Organizations independent of that body increase the army of unionism to approximately the two million mark. Mr. Gompers claims that 25 per cent. of the workmen in the mechanical trades are unionized. In some trades he claims 95 per cent. of the men. The annual revenue of the American Federation of Labor is over \$225,000, but this is only a small portion of the money paid by labor for the cause of unionism. Millions of dollars annually go into the treasuries of the several thousand subordinate unions. Some of the organizations have large funds on deposit in banks, in several instances running over a million dollars. Last November the American Federation held a convention at San Francisco which cost labor a quarter of a million. These figures prove that organized labor is a powerful institution, one that challenges our most serious consideration.

#### **Interstate Commerce Legislation.**

A remarkable public agitation on another economic question besides that of labor has deeply stirred the entire country during the last year, and that question is whether the Government through its Interstate Commerce Commission shall regulate railroad rates and practices. The intensity of the general discussion of this question was in good part due to an earnest recommendation for railroad regulation by the President in his last annual message to Congress. The recent session of Congress naturally became the center of the agitation, and after protracted hearings by the House Committee on Interstate Commerce a measure known as the Esch-Townsend bill was reported to the House and passed by that body with little debate and by a very large majority. This action of the House is generally credited with being an effort to satisfy what was regarded as the political exigencies of the situation.

At the Pittsburgh convention last year a resolution was adopted indorsing the Quarles-Cooper bill, which at that time reflected the views of those demanding railroad regulation. It seemed to be the understanding of many that this bill was in line with laws already existing to prevent discriminating rates, and its full significance as a measure authorizing the fixing of rates by the Government was not developed in the consideration of the resolution. In fact, the resolution was passed without debate, the convention being pressed for time in which to take up other matters. The proposition to have a Government commission fix freight rates has never been a subject of earnest consideration by the association, and the same is true of many other organizations of business men. While there had been some public agitation of the matter it was not until the recent session of Congress that thousands of manufacturers and shippers gave it earnest thought and study. However, a certain portion of the press and some of those in public life apparently believed that the shipper would of course favor any proposition which promised cheaper rates, and there followed a clamorous campaign, ostensibly in behalf of the shipper, to force through Congress a bill which was essentially socialistic.

#### **Lowest Rates and Best Service.**

Is there anything in the present railroad situation which gives a valid excuse for Government regulation of rates? In other words, what sound argument can be advanced for the overthrow of the competitive system pertaining to the prices of transportation and the substitution of the socialistic system in its place?

What would be the effect of a socialistic fixing of rates on the building of new railroads? This is a question of particular importance to the people of the Middle West, of the South and the Southwest, where the possibilities of railroad construction have by no means been exhausted. The strongest incentive for the building of new roads is the making of good profits by roads already in operation. With increasing production, competition to sell reduces prices; with increased railroad mileage, competition for business must bring down the rates of transportation. Suppose when the first railroad line was built the Government had declared its rates "unreason-

able" and had fixed a legal rate, does any one believe there would have been such a great era of railroad construction as followed?

One would think from the outcry going up for the fixing of rates that railroads were absorbing the earnings of the nation through extortionate charges. Long figures concerning the so-called railroad "tax" are presented by advocates of the pending bills. It would be just as reasonable to ascertain how much the farmers obtained last year for their products and call it an agricultural "tax" on the nation. The attempt is made to make it appear that the railroad rates are so high that the shippers and the general public can no longer stand the extortion, but must have relief from Congress. Now the simple, incontrovertible fact is that railroad rates in this country are far cheaper than anywhere else in the world.

Although wages or the average returns on labor are much higher, yet the people of this country have the advantage of better transportation service at cheaper rates than is enjoyed in any other country. As this very satisfactory condition has been brought about under our individualistic system, and as under the continued working of free competitive conditions rates may be expected gradually to decline, it remains for the advocates of the inelastic socialistic rates to show why any change from competitive conditions is desirable and whether socialistic rate making would insure lower rates in the future.

#### **Impartial Treatment of General Public.**

I believe it is a gratuitous assertion on the part of the leaders of the anti-railroad agitation when they say that the shippers generally are clamoring against what is termed extortionate rates. The complaints coming from shippers against the railroads are almost wholly complaints of discrimination in favor of other shippers. I feel safe in asserting that what the shippers in this country want is impartial treatment from the railroads rather than arbitrary reduction of rates.

The question of interstate commerce is one which should be solved in accordance with fundamental principles, the same as the labor question. Under our system of individual initiative the individual must not be hampered or checked in doing as he pleases with his own.

If the law is not enforced, then it is not the fault of the law if rebates continue to be given. If the law is not sufficiently adequate, then it should be amended. Perhaps it could be made better by declaring that when it is found that a secret lower rate or rebate has been granted to any shipper such rate shall become the open rate for say one year, as though the rate were part of the published classification.

It is urged that unjust discriminations between localities and different kinds of traffic are such as to require the granting of additional powers to the Interstate Commerce Commission. I believe that a study of the facts will show that discriminations of this character are not numerous and that many of the complaints are traceable to legitimate and beneficial competition between rival localities.

Any proper legislation that shall be based on the fundamental principle that the general public shall not be discriminated against—that is, legislation to protect free competitive conditions—appears to my mind to be necessary and legitimate. But to attempt to correct evils by legislation to destroy competitive conditions, and to take from individuals the control of their own property, appears to me to be folly which cannot fail to result disastrously to the industrial interests of the entire country.

#### **Concentration of Capital.**

Perhaps the argument that the consolidation of railroads is destroying competitive conditions is worthy of some attention. Up to the present time, however, it has not been shown that these consolidations have resulted in the increasing of railroad rates. On the other hand, it is to be noted that many economies have been worked in the railroad business and that on the whole the service to the public has been much improved.

Because the village bootmaker is supplanted by the small factory and the small factory by the large factory is not in itself evidence that competition is being de-

stroyed. It is merely a sign that competition is reaching higher planes, where it is less a competition between the labor of different men than it is competition between accumulations of capital. It is no longer possible to produce commodities cheap enough to sell in the open market without utilizing capital in their production, and the larger the amount of capital necessary to compete against existing enterprises the cheaper will be found the price of the commodities produced.

Since civilization develops as the per capita production is increased by the enlarged utilization of capital, the concentration of capital in great enterprises should be taken as a gauge of progress and not as a development to be looked upon with fear. Big corporations are merely a sign of a great and highly civilized country. It is not at all likely that any way will ever be found to prevent capital from competing against capital.

#### **Maintenance of Competitive Conditions.**

While the concentration of capital in railroad and other enterprises is in line with natural development, and adverse legislation to prevent it is therefore folly, yet the big corporation must be prevented from abusing its power. The big corporation must depend for its existence solely on its own ability to produce cheaper than its competitors. For it to seek to close the markets against its competitors by means of railroad rebates or other devices in restraint of trade is tyranny, which cannot be tolerated. Not to provide punitive legislation sufficiently adequate to prevent such tyranny is to defeat justice and to lend encouragement to the socialistic movement. While this is true, however, I believe that the evil effects of all the rebates and abuses of power by corporations are insignificant when compared to the great benefits accruing to the whole people by reason of the free competitive system in industry. Therefore, free competitive conditions should be maintained in the railroad world as well as in other departments of industrial life.

#### **The Tariff and Reciprocity.**

Tariff revision is again being given prominence in public discussion. The President has assigned it a leading place in the announced policy of the Administration, though the changes made in the Philippine bill as originally introduced and the refusal of the Senate to ratify the reciprocity treaty with Newfoundland give little encouragement to those who look for Congressional action in the near future.

To my mind there are some features in the present tariff situation that open to serious question the wisdom of the "let alone" or "stand-pat" policy. The foreign demand for our agricultural products appears to be declining, and the exportation of manufactured commodities is not nearly so great as it should be, notwithstanding the fact that last year it amounted to over \$500,000,000 for the first time in our history. The pressure to find a foreign vent for the product of our mills and factories is constantly becoming more pronounced, but how in the face of unfavorable foreign tariffs we can materially develop markets abroad is difficult to see, unless through the adoption of a more liberal tariff policy on our own part we secure compensating concessions in the tariff schedules of those countries whose markets we seek.

Our chief customers abroad are the European countries, the amount of our exports to which in 1904 was \$1,057,000,000, about two-thirds of our entire exportation. The value of this trade is such as to compel careful attention to matters which threaten its continuance or development. In recent years the policy of discrimination against our trade by European Governments has become more and more intensified, and that our high tariff and our failure to make reciprocity agreements have much to do with this cannot be doubted. Illustrating the attitude of European countries is the adoption by Germany of a new tariff, which has not yet been put into force, but which, if it is enforced against us, will raise duties on American imports to a remarkable degree. Russia has also devised a new tariff which provides almost prohibitive duties, but which has not been put into force pending the making of special treaties with other



countries. In France our manufacturers are handicapped by more favorable tariffs enjoyed by their English and German competitors. In England a great political agitation is being waged in behalf of a tariff system which would by preferential duties to the British colonies discriminate against American food products and manufactures. The outlook in other countries is equally suggestive of future injury to our foreign commerce and the advisability of the adoption of a less exclusive policy than we have heretofore pursued.

#### Broader Foreign Market Needed.

The common aim of all countries being that of obtaining as large a foreign market as possible for their own products while preventing to the largest degree possible the sale of foreign products in their own market seems to add force to the conclusion of many who have studied the tariff problem that if we reduce our tariff schedules it should be to secure concessions in the tariffs of other countries. In other words, reciprocity would be a wiser course than tariff revision. If this country should adopt a maximum and minimum tariff, to be used as a basis for special treaties with other countries, which I think it should do, or even if the reciprocity provisions of the Dingley law were taken advantage of, it would seem that much benefit to the commercial interests of the country could be accomplished.

This association has in the past declared itself in favor of reciprocity, but the reciprocity it has favored has been rather that of the kind which offers concessions for noncompetitive articles alone. As is frequently stated, it is reciprocity which does not injuriously affect any home industry. Now, in my opinion, such reciprocity means practically no reciprocity at all, for the range of articles produced abroad which cannot be produced here, aside from the natural products of the tropics, is very narrow.

#### Canadian Reciprocity.

The association at the Pittsburgh convention last year adopted a resolution in favor of reciprocity with Canada, and I would like to see that resolution reaffirmed at this meeting. During the year the agitation for better trade relations with our northern neighbor gained considerable force. Canada is the largest foreign customer we have for our manufactured products, and as it is a natural market for these products, we ought to encourage by every means in our power the retention for ourselves of this field.

**The Gayley Dry Air Blast.**—A serious error has crept into the paper presented by James Gayley before the American Institute of Mining Engineers at the Washington meeting, and published in abstract in *The Iron Age*, May 11, pages 1520 and 1521. It is in the January record, second column, page 1520. The average coke consumption for the period of January 1 to January 10, using dry blast, is given as 2078 pounds. The correct figure is 1825 pounds.

**New York's Future as an Iron Center.**—Progress is being made with the project of building a plant of two blast furnaces in New York harbor. A site has been acquired at Weekhawken, N. J., which gives 2000-feet of river front. It is the purpose of those interested to make pig iron for the open market. Nothing further has developed with respect to the works which Charles M. Schwab and associates are to build at Carteret, N. J. It is understood that the works will comprise four modern blast furnaces and a steel plant.

The Westinghouse Air Brake Company, Wilmerding, Pa., will follow its annual custom the coming summer in offering prizes for the improvement of lawns, gardens and premises in general of its employees in that town. This will be the fifth year in which the company has carried out the competitive plan for civic beautification. Only employees of the company are eligible to participate in the contest. The competition is open to any member of the families of the company's workmen, regardless of age or sex.

### The Sault Canal Commerce.

The annual report of the Sault canals, which connect Lake Superior with the lower lakes of that great chain, has just been issued by the Government, to cover the year 1904. While 84 per cent. of the business of the lake was carried through the American canal, the figures are a combination of both the American and Canadian passages and cover the entire business of Lake Superior to and from all American and Canadian points.

The figures of this waterway run to vast proportions; in the first place there was three times as much freight carried through the canal in the eight months of navigation in 1904 as was taken through the Suez Canal for the full year period corresponding thereto. This freight amounted to 31,546,106 tons, and there were total "mile tons" for ships passing the canal of nearly 27 billion. This is equivalent to the statement that the average distance that freight was carried was 843½ miles. The total value of the freight carried through was \$334,503,000, and there were paid to ship owners for moving it \$21,553,000. This made a freight charge per ton per mile of all goods carried through the lakes, including high priced as well as cheaper commodities, of 8-10 mill. Indeed for some low cost freights the charge per mile was but \$0.00040. This latter figure was for coal, a commodity carried by millions of tons the whole length of the lakes.

Vessels to the value of \$69,166,000 were engaged in the Lake Superior traffic, in addition to the value placed on whatever unregistered craft were using the canal. There were 886 of these vessels, including everything of all classes, and their average value was, therefore, about \$80,000 each. This is not alone for the big freighters, worth up to \$400,000, but the tugs and small craft, that are worth a few hundred dollars. The American canal was operated 224 days during the year and the Canadian canal 241 days. The American canal passed 84 per cent. of the commerce, but American vessels handled 94 per cent. of the freight. They carried only 37 per cent. of the 56,600 passengers.

During four months of the year the traffic amounted to more than 5,000,000 tons a month, and for August the volume was 5,645,000 tons.

The statement shows the rapidity of growth of the shipping on the upper lakes. In 1894 there were 15 vessels carrying between 3000 and 4000 tons, but none larger; in 1898 there were five 8000-ton ships; in 1899 there were five 9000-ton carriers, and this was the limit till 1904, when there were three of a capacity up to 10,000 tons, and one larger than that which loaded a cargo of 11,536 tons. The figures do not yet show it, but there will be six more of this biggest class during the year now begun.

The freight charge per ton-mile—.81 of a mill—was less than for any year in the history of the trade, except in 1898, though in 11 years it has but twice exceeded one mill.

Previous to the completion of the first canal, in 1855, built under grants from the State of Michigan, the movement of freight to Lake Superior was entirely by boat to Sault Ste. Marie, where it was unloaded, portaged a mile across the rapids, and reloaded into other boats for further transit. It is needless to say that the volume of freight was slight, but in 1851 there were 12,500 tons carried around the rapids in this way. The opening year of this canal the business amounted to 14,503 tons, and in 1902 it was 35,961,146 tons. The increase in tonnage of each year's traffic over that immediately preceding has been about 20 per cent. during the entire period of 50 years.

The Ste. Marie Falls, which these canals are designed to overcome, are half a mile wide and three-fourths of a mile long and have a fall of about 18 feet. A little canal was built by the Northwest Fur Company in 1797, but it was destroyed by the Americans in the War of 1812. The cost of the various improvements since 1855 has been \$16,000,000, in addition to which the United States Government is now spending many millions in improving the approaches below the locks and will soon construct a new and larger lock at a cost of millions more.

## The Production of Coal in 1904.

### Annual Report of the United States Geological Survey.

WASHINGTON, D. C., May 16, 1905.—The production of coal in 1904, according to the complete returns compiled for the United States Geological Survey by Edward W. Parker, statistician, amounted to 351,196,953 short tons (or 313,568,780 long tons), having a total value at the mines of \$445,643,528. Compared with 1903 this shows a falling off of 6,159,563 short tons in quantity and of \$58,080,853 in value. This decrease, although proportionately large in the figures of value, does not indicate any interruption to the generally prosperous conditions which have prevailed during the last eight years. It was simply a natural reaction from the abnormal activity which had been maintained throughout the coal mining regions in 1903, due to the exhaustion of all coal stocks on hand by the memorable anthracite miners' strike of 1902. In order to renew the coal stocks and at the same time to provide fuel for immediate use the coal mines in 1903 were pushed to their utmost capacity, or, one should probably say, to the capacity of the railroads to handle the output. As a result the enormous production of 357,356,416 short tons was then recorded. Prices raised high by the famine of 1902 remained high for a large part of the year, and the total value of coal at the mines, before any expense of transportation or selling costs had been added, amounted to \$503,724,381, an increase of \$136,600,000 over that of 1902.

The production in 1904, while less than that of 1903 by 6,159,463 short tons, exhibits a normal increase when compared with the annual production during the ten preceding years. The average price for all coal mined and sold in 1904 was \$1.27, as compared with \$1.41 in 1903 and \$1.22 in 1902.

#### Pennsylvania Anthracite.

The statistics for the production of anthracite in Pennsylvania, which are complete, show that the output in 1904 amounted to 65,318,490 long tons (equivalent to 73,156,709 short tons), valued at the mines at \$138,974,020, as compared with 66,613,454 long tons (or 74,607,068 short tons), valued at \$152,036,448, in 1903. The decrease in production in 1904 therefore amounted to 1,294,964 long tons (or 1,450,359 short tons), while the falling off in gross revenue amounted to \$13,062,426. Of the total production of Pennsylvania anthracite in 1904, 57,727,178 long tons were shipped to market, 1,410,703 tons were sold to local trade and employees, and 6,180,609 tons were used at the mines for steam and heat. The average price for the marketed product (excluding colliery consumption) in 1904 was \$2.35, as against \$2.50 in 1903.

One of the interesting features in connection with the anthracite trade is the constantly decreasing proportion of the large or more profitable sizes of coal sent to market and the equally constant increase in the proportion of small or less profitable coal. In 1890 77 per cent. of the shipments from the anthracite regions consisted of sizes larger than pea coal and 23 per cent. represented the shipments of pea coal and smaller. In 1904 the large sizes made up only 62 per cent. of the total, while the small sizes had increased to 38 per cent. Or, putting it in another way, the total tonnage of large sizes from 1890 to 1904 has increased 25 per cent (from 28,154,678 tons to 35,636,661 tons), while the tonnage of small sizes has increased 153 per cent., from 8,460,781 long tons in 1890 to 21,855,861 long tons in 1904.

The recovery of usable coal from the old culm banks by washing has furnished some of this increase in the shipments of small sizes, and the installation of washeries at the breakers for saving the small sizes in the primary preparation of the coal has done more. The recovery from the old culm banks has averaged about 2,500,000 long tons annually during the last four years.

#### Bituminous Coal.

The statistics of bituminous coal production comprise all varieties except Pennsylvania anthracite, and include

semianthracites, semibituminous, cannel, splint and block coals, and brown and black lignites. The small production of anthracite in Colorado and New Mexico is also included in the bituminous output. In 1904 the aggregate production of all these varieties amounted to 278,040,244 short tons, valued at \$306,669,508, against 282,749,348 short tons, worth \$351,687,933, in 1903, indicating a decrease of 4,709,104 tons in amount and \$45,018,425 in value. The average price a ton for coal mined and sold, including colliery consumption, fell from \$1.24 in 1903 to \$1.10 in 1904.

#### Production in 1903 and 1904.

The following table shows the coal production of the United States in 1903 and 1904:

State.	1903. Short tons.	1904. Short tons.	Decrease. Short tons.
Alabama .....	11,654,324	11,163,194	491,130
Arkansas .....	2,229,172	2,009,451	219,721
California and Alaska .....	105,420	75,388	30,032
Colorado .....	7,423,602	6,594,295	829,307
Georgia and North Carolina ..	434,260	400,191	34,069
Idaho .....	4,250	3,330	920
Illinois .....	36,957,104	35,990,796	966,308
Indiana .....	10,794,692	10,929,908	*135,216
Indian Territory .....	3,517,388	3,011,972	505,416
Iowa .....	6,419,811	6,542,005	*122,194
Kansas .....	5,839,976	6,322,875	*482,899
Kentucky .....	7,538,032	7,559,940	*21,908
Maryland .....	4,846,165	4,819,171	26,994
Michigan .....	1,867,619	1,338,447	29,172
Missouri .....	4,238,586	4,187,197	51,389
Montana .....	1,488,810	1,359,409	129,401
Nevada .....	.....	150	*150
New Mexico .....	1,541,781	1,452,183	89,598
North Dakota .....	278,645	269,297	9,348
Ohio .....	24,838,103	24,415,054	423,049
Oregon .....	91,144	111,540	*20,396
Pennsylvania (bituminous) ..	103,117,178	97,916,733	5,200,445
Tennessee .....	4,798,004	4,782,302	15,702
Texas .....	926,759	1,072,194	*145,435
Utah .....	1,681,409	1,491,607	189,802
Virginia .....	3,451,307	3,576,092	*124,785
Washington .....	3,193,273	3,185,757	57,516
West Virginia .....	29,337,241	32,332,385	*2,995,144
Wyoming .....	4,635,293	5,177,381	*542,088
Total bituminous .....	282,749,348	278,040,244	4,709,104
Pennsylvania anthracite ..	74,607,068	73,156,709	1,450,359
Grand total .....	357,356,416	351,196,953	6,159,463

\* Increase.

Among the 31 States included in the above table there were only 10 in which there was an increase of production in 1904, and these 10 include the State of Nevada, which is credited with 150 tons in 1904 and had no production during the preceding year. Of the more important producing States West Virginia, Indiana, Kentucky, Iowa, Kansas and Wyoming were the only ones that showed an increase in production in 1904. The only important increase was made by West Virginia, whose output in 1903 was curtailed by labor troubles, and whose gain in 1904 amounted to 3,000,000 tons.

Mr. Parker also presents a table showing the growth of the coal mining industry during the last 25 years. In 1880 the production was 76,157,945 tons. The 100,000,000-ton mark was passed in 1882 and a product of 200,299,199 tons was reported in 1897. In 1902 the output was 301,590,439 tons.

W. L. C.

**The New England Foundrymen's Association.**—The monthly meeting of this association was held at the Exchange Club, Boston, May 11, with Vice-President B. M. Shaw in the chair. The United States Graphite Company, Saginaw, Mich., and the Joseph Dixon Crucible Company, Jersey City, N. J., were unanimously elected to membership. The chair appointed A. J. Miller, Providence, R. I., and Secretary F. F. Stockwell a committee to look up the matter of transportation and other information relative to the annual convention of the American Foundrymen's Association, to be held at New York June 6, 7 and 8. After a short discussion of quiz topics dinner was served. The after dinner feature was an address by M. M. McNaughton of the Joseph Dixon Crucible Company on "Graphite and Facings." The next meeting of the association will be in the form of an outing to Nantasket, down Boston harbor, in June.



## Enterprise in Canada.

### A Niagara Power Concession Canceled.

TORONTO, May 13, 1905.—It has been decided by the Ontario Government to disallow the second franchise granted to the Electrical Development Company of Ontario at Niagara Falls. This company, which is made up of Toronto capitalists, is one of the three corporations that are establishing large works for the production of power in Queen Victoria Niagara Falls Park. Its operations there are in pursuance of an agreement with the Ontario Government under which the company holds the right to develop 125,000 horse-power. Toward the end of last year the company made a second agreement with the Park Commissioners, thereby acquiring the right to develop 125,000 horse-power more. This agreement was approved by the Government, the order in Council adopting it having been passed but a few days before the general elections of January last. These resulted in the defeat of the Government. In the regular course of business this second agreement came up for the consideration of the new Government, whose duty it would be, if the transaction met its approval, to recommend it to the Legislature for ratification. But it was not acceptable to the new Government, whose policy in respect to the natural power centers in the possession of the Crown is not the same as that of its predecessor. The announcement was therefore made some days ago that the second agreement would not go into effect. On Tuesday Hon. Adam Beck, the member of the Cabinet who has given most attention to the power question, addressed the Legislature at considerable length on the subject. The two main reasons for the canceling of the second agreement, he said, were, first, the weakness of the clauses in which the company's obligations were stated, and, second, the impolicy of making a further concession to the company on any conditions. In brief, the Government felt that the public interest called for the reservation from private control of the 125,000 horse-power concerned. It was pointed out, too, by other speakers on the Government side that the Park Commissioners were really adverse to the agreement, their concurrence in it being apparently to please the Government of the day, as they had reported that the franchises already granted, permitting the development of 475,000 horse-power, were all that could be required for a considerable time and that the granting of concessions had reached a point at which the interests of the public and the conservation of Niagara's energies ought to be very carefully considered. Mr. Beck's speech was further interesting because of the announcement it contained of the Government's power policy. He stated that a commission would be appointed, its members to be experts of reputation on the subject of developing electricity at natural water power points. By this commission's reports the Government will be guided, so that if a Provincial plant is recommended here or there as a means of supplying municipalities and private manufacturers and traction companies with cheap power such plant may be established.

On the subject of the cost of Niagara power Mr. Beck made some statements that may be regarded as important, coming from a man who has studied the question sufficiently to be considered an authority on it. On this point his remarks were, in part, as follows:

Three Canadian power companies have been incorporated. Under agreements entered into with them rights have been given to develop as follows: The Canadian Niagara Power Company, 100,000 horse-power; the Ontario Power Company, 250,000 horse-power; the Electrical Development Company, 125,000 horse-power; total, 475,000 horse-power.

Of this authorized amount of 475,000 horse-power machinery is now being installed by the different companies to provide for an aggregate output of 120,000 horse-power.

It is clear that when the companies prepared for an output of 120,000 horse-power they had a reasonable expectation of selling that amount. But the development of the commercial interests of the province is going on so rapidly that it will not be long before power consumers will require the whole authorized development of 475,000 horse-power.

From independent inquiries I have made from thoroughly competent sources I am of the opinion that the 120,000 horse-power presently in the course of development may, when completely developed, be transmitted to any part of the Province within a radius of 200 miles of Niagara Falls at a minimum average cost—after providing for depreciation, for maintenance

and bond interest—of \$15 per continuous horse-power per annum. And by the time that the whole 475,000 horse-power is developed and consumed the delivered cost, including all the items already mentioned, should not be more than \$12 per horse-power per annum.

### A Wire Fence Contract.

In the Dominion House of Commons Sir Wilfrid Laurier stated in reply to a question that no contract had yet been made for the erection of the wire fence the Government proposes to build along the international boundary to separate the ranches of the Canadian Territories from those of the Western States. The member who made the inquiry afterward returned to the subject, reading to the House letters stating that the contract had been let without tender to parties in Walkerville, Ont. One of the letters was from the Secretary of the Interior Department. The information was given in response to an inquiry made at the Department by the Page Wire Fence Company. Sir Wilfrid said there was evidently some mistake. After inquiring into the matter, he reported to the House that he was right and the Secretary of the Interior wrong. The latter, he said, had incorrectly assumed that the contract was let, owing to certain preliminaries pointing to that conclusion having been arranged. It appears that a letter was written to the Walkerville parties by the Interior Department in January, asking for quotations on 200 miles of fence. On January 10 the reply came back in the form of a tender at the rate of \$560 per mile. So far, Sir Wilfrid said, nothing more has been done. The estimates contain an item of \$100,000 for the building of the fence, but the contract has yet to be placed.

### Tin Plate Freight.

Complaint comes from the Franklin E. Saunders Company, manufacturer of tin plate in Wales, that it has so far been unable to obtain satisfactory freight reductions west of Montreal, and as a consequence has lost an order for 1500 tons, valued at about £20,000. The order was for a Toronto concern, which the Saunders Company says has gone to the United States for the goods. The company declares that United States manufacturers have the benefit of a lower rate of freight. It is further stated that a Canadian house ordering tin plate inquired from the Canadian Pacific Railway Company if it was not possible to bring the rates down to last year's level, and received in reply a telegram stating that it was impossible. The Saunders Company says that unless the railroad people give better terms west of Montreal the Welsh tin plate makers will have to let their competitors in the United States get possession of the Canadian market.

### Notes.

Frederick Davidson, treasurer of the Union Drawn Steel Company, Beaver Falls, Pa., says that his company will establish a plant in Hamilton. Temporary premises are to be made use of until a proper factory can be built, as the Canadian demand is too pressing, he says, to be put off until permanent works are constructed. The company expects to be turning out product in Hamilton by July 1.

The Massey-Harris Company will add a four-story brick warehouse to its Toronto agricultural machinery works. The cost is to be \$125,000.

A modern pipe foundry of large capacity is to be erected by the Canada Foundry Company in connection with its extensive Toronto works. Before drawing up the plans the company had the leading pipe foundries of the United States examined.

Black Island, in Lake Winnipeg, has iron deposits believed to be valuable. A company has been formed to work them.

D. Milne, chairman of the Industrial Committee of Sarnia, returned from New York a short time ago assured that the United States Steel Corporation, with a committee of whose directors he had been in negotiation, will build a plant in Canada. He says that no place has been definitely decided upon, but that Sarnia for the time being has the preference.

The McLachlan Gasoline Engine Works Company, Toronto, will build new shops. It finds this step necessary in order to keep pace with a growing demand. Gas-

oline power is very much favored in the Canadian Northwest for the economical operating of threshers.

A bill introduced into the Ontario Legislature to incorporate the Hamilton Terminal Railway Company was rejected by the Railway Committee. The property concerned is 25 miles of railway track in the yards of the Hamilton Steel & Iron Company, which sought the incorporation of it under a separate company. But the opposition was too great.

C. A. C. J.

### The Tennessee Coal, Iron & Railroad Company.

Don H. Bacon, chairman of the board and president of the company, has submitted to the stockholders the annual report for the fiscal year ending December 31, 1904, from which the following extracts are taken:

Up to the first of October the year 1904 was one of low prices for pig iron, a very large tonnage having been sold on the basis of \$9 for No. 2 Foundry. Since October 1 prices have been much higher, but the output of the furnaces has been restricted owing to the strike of the union coal miners, which began in July and materially reduced the output of coal and coke. The five furnaces at Ensley, however, which supply metal for the steel plant, not only have been kept continuously in operation, but have made new high records for production at a much lower cost than in any previous year. The new furnace which has been under construction at Ensley, known as No. 6, has been completed and is about to go into blast.

The Ensley steel plant has had a very successful year. The average monthly product of steel for the last six months of the year shows a gain of over 25 per cent, and for the last quarter a gain of over 40 per cent., as compared with the year 1903, the product per month for October, November and December, 1904, exceeding 20,000 tons. The operations of the rail mill have demonstrated the ability of this company to produce successfully open hearth steel rails of so superior a quality as to insure a market for all that the mill is able to produce, inquiries for the current year having far exceeded the supply. The mill was in steady operation during the entire year, and besides increasing the output, which was over 16,000 tons of finished rails in December (exceeding by 100 per cent. the best month in 1903), developed a practice showing a relatively smaller percentage of second and imperfect quality rails than is attained by most other mills. The open hearth department is being enlarged by the construction of another furnace, which will increase the product 2000 to 2500 tons per month.

The strike inaugurated by the United Mine Workers of America in the coal mines of the company, heretofore briefly alluded to, was the most important event of the year in its far reaching consequences to the company. The nominal question involved was one of wages and rules, but the differences in these regards were slight, the real point at issue being vastly more important, indeed vital, to the future prosperity and even the independent existence of this and similar manufacturing companies in the district.

The conditions forced upon the management by the union had become intolerable. The authority of the company's representatives over the property in their charge, as to the manner in which the work should be done, as to what should constitute a fair day's work and as to who should be employed, had to be restored and maintained, or all hope of permanent, successful competition with the products of other districts would have to be abandoned.

Another important consideration arose from the desire to introduce electric coal cutting machines, similar to those in use in Pennsylvania, Ohio and other Northern States. The company asked the union to allow it the same differential for machine mined over pick mined coal that is allowed by the union in Pennsylvania at corresponding mines. This was refused, the union officers offering a differential nearly 50 per cent. less than is allowed by their organization elsewhere, it being clearly their intention to prevent the use by this company of coal cutting machines. Under the present nonunion operation the machines have been introduced with most satisfactory results.

As illustrating the decreased efficiency resulting from union domination I cite the Gamble mine of this company in Walker County, Alabama. Since being made a nonunion mine the product per man per day has increased 1½ tons and the earnings per man per day have increased 52½ cents. At the same time there has been accomplished a reduced cost per ton of product to the company. There has been no change either in the mine, the manner of working or the equipment. The increased output and earnings are due solely to greater capability and effort on the part of the men.

The strike having been declared, the management immediately announced its purpose to reopen all its mines on a strictly nonunion basis. Operations were gradually resumed at all of the principal mines, except where the introduction of improvements caused a further delay. The strike has unfortunately been marked by some violence.

The company now has in its employ a sufficient force of miners. Many of the old employees have returned to work, and men have been attracted from other States by reason of the very satisfactory conditions of labor existing in this district. When the new men have acquired the necessary familiarity with location and conditions, when the completion of the mechanical improvements now being installed permits of the full resumption of the mines still idle or in partial operation, it is confidently expected that normal conditions of product and cost will be restored.

Early in the summer of 1904 a committee of appraisers was appointed, representing the Sloss-Sheffield Steel & Iron Company, the Republic Iron & Steel Company and this company, to estimate the amount and quality of the coal and iron ore owned by each company. An examination covering several months was conducted, as the result of which a report signed by every member of the committee was submitted, showing that this company owns in fee over 395,000,000 tons of red ore, of which 381,000,000 tons are graded as first class, 10,177,000 tons of brown ore and over 1,623,000,000 tons of coal, of which 809,112,000 tons are coking coal. In the noncoking coal is included, however, 300,000,000 tons of Cahaba seam coal, which is unexcelled in Alabama or the South for steam and domestic purposes and commands the highest market price of any grade of coal in the district.\*

The men in charge of this company's iron mines estimate the holdings of iron ore of this company to be still larger—viz., of first-class red ore, over 450,000,000 tons; of second-class red ore, over 95,000,000 tons, and of brown ore, 16,900,000 tons. From the iron ore owned in fee by this company as many tons of pig iron can be made as from all the ore that has been shipped from the Lake Superior region from 1855 to 1904, inclusive; and, assuming that this company's furnaces in Alabama make 700,000 tons of pig iron per year, it would require 200 years to exhaust its supply of coking coal and first-class red and brown ores. The company owns in addition many thousand acres upon which no explorations for minerals have ever been conducted, and it is not improbable that some of these lands may hereafter be found to contain a large tonnage of ore and coal.

During the last four years, or since the present management was given charge of the properties of the company, expenditures for new construction amount to \$5,512,232.65, and for the purchase of mineral lands, the consolidation of our holdings, the correction of title and the conduct of explorations preliminary to development, a further sum of \$401,006.79 has been expended, a total of, approximately, \$6,000,000. After deducting the proceeds of properties sold, a net sum exceeding \$5,250,000 has been expended for this purpose. This entire sum has been provided out of net earnings of the company for the period; for though the bonded debt has been increased, the current liabilities have been correspondingly decreased and nearly \$2,000,000 of marketable securities of

\* NOTE.—The report of the appraisers further shows that of the total mineral holdings of the three companies, the proportion owned by the Tennessee Company is represented by the following percentages:

	Per cent.
Of red and brown ore (all grades).....	77.4
Of first-class ore.....	80.6
Of coal.....	68.2
Of coking coal.....	64.8



the company are held in the treasury, so that the net indebtedness of the company, fixed and floating, shows an actual decrease on December 31, 1904, as compared with January 1, 1901.

*Income Account, Year Ending December 31, 1904.*

Gross sales and earnings.....	\$9,535,404.12
Cost of operating (labor, materials, &c.) .....	\$6,300,286.73
Repairs and maintenance.....	1,213,844.44
General expense, taxes, &c.....	458,475.74
	<u>7,972,606.91</u>
Net earnings from operation.....	\$1,562,797.21
Deduct interest and miscellaneous profit and loss items .....	761,583.24
Net profits.....	\$801,213.97
Deduct appropriations for depreciation.....	256,225.28
Deduct sinking fund.....	48,730.00
Balance.....	<u>\$496,258.69</u>
Dividends on preferred stock.....	19,006.23
Surplus for the year.....	<u>\$477,252.46</u>
Total surplus December 31, 1904.....	\$2,122,334.96

**GENERAL BALANCE SHEET.**

<b>Assets.</b>	
Property account.....	\$36,122,436.08
Investments.....	297,305.94
Trustees of bond sinking funds.....	54,103.79
Treasury securities.....	1,995,000.00
Cash.....	463,108.44
Bills and accounts receivable.....	1,151,277.91
Inventory accounts.....	1,442,789.44
Total.....	<u>\$41,526,021.60</u>
<b>Liabilities.</b>	
Capital stock—Common.....	\$22,552,800.00
Preferred.....	248,300.00
Total capital stock.....	<u>\$22,801,100.00</u>
Bonded debt.....	13,693,000.00
Guaranteed securities of proprietary company....	1,540,000.00
Reserve and provisional funds.....	256,056.21
Sinking fund on general mortgage.....	48,730.00
Bills payable.....	150,000.00
Accrued interest and unrepresented coupons.....	329,185.01
Audited vouchers, pay rolls, &c.....	582,571.42
Proportion of dividend on preferred stock.....	3,044.00
Surplus.....	<u>2,122,334.96</u>
Total.....	<u>\$41,526,021.60</u>

The average number of men employed was as follows:

At furnace and manufacturing plants.....	2,925
At coal mines and coke ovens.....	3,974
At iron mines and limestone quarries.....	1,701
Miscellaneous.....	80
Total.....	<u>8,680</u>

The production of raw and finished materials during the year 1904 was as follows:

<b>Gross tons.</b>	
Red ore (Red Mountain mines).....	1,095,432
Brown ore (Greeley mines).....	69,541
Brown ore (Bartow mines).....	43,065
Total.....	<u>1,208,038</u>
Coal, for conversion into coke.....	1,331,063
Coal, for general market or consumption.....	1,425,237
Total.....	<u>2,756,300</u>
Coke.....	871,532
Limestone and dolomite.....	218,484
Foundry and basic pig iron.....	475,314
Open hearth steel ingots.....	176,657
Blooms, large billets and slabs.....	14,102
Rails.....	124,496
Muck bar.....	2,724
Bar iron and steel.....	9,958
Plates.....	6,710

The company owns and operates 17 blast furnaces, 10 50-ton basic open hearth steel furnaces, 1 250-ton primary furnace, 1 15-ton converter, blooming mill, rail mill and bar, guide, plate and fire bed mills, 21 iron ore mines, 24 coal properties, 3482 coke ovens and 3 limestone and dolomite quarries.

The eleventh annual convention of the Car Inspectors, Car Builders and Railway Mechanics of America is in session in Pittsburgh this week. The organization has a total membership in the United States of about 12,000, 10 per cent. of these being in the Pittsburgh district.

The Jamison Coal & Coke Company, Frick Building, Pittsburgh, has taken over the interests of the Alexander Coal Company in the vicinity of Crabtree. The Jamison Company is one of the largest holders of coking coal lands in western Pennsylvania.

## Slag Cement.

BY W. B. RUGGLES, NEW YORK.

The first hydraulic cement known to man was Puzzolana cement, discovered by the Romans. It was first used by them as a mortar in laying brick and stone, probably because the puzzolana, which is a volcanic scoria found at Puzzuoli, near Rome, was a cheaper material to use than sand. The hydraulic property of this mortar was evidently soon discovered, and a true cement concrete was used by them earlier than 500 B. C. In the temple of Jupiter, Juno and Manivero, built in 509 B. C., the remains of large masses of Puzzolana cement concrete are found in a good state of preservation.

In the temple of Castor, built in 496 B. C., this concrete was largely used. The Encyclopedia Britannica says: "The entire Podium is filled up by a solid mass of concrete, made of broken tufa, puzzolana and lime, the whole forming a lofty platform, about 22 feet high, solid as a rock, on which the columns and upper structure are erected."

In the temple of Concord a part of the forum built in 349 B. C., similar masses of concrete are found. In the Paladium, built about 300 B. C., are the massive remains of some large cella, nothing of which now exists except the concrete core, although it was probably once lined with marble. Many other buildings are found in which practically the only parts remaining are those built of this concrete.

In 27 B. C. the Pantheon was built with walls 20 feet thick, and the dome covering the central portion, 142 feet 6 inches in span, was cast in concrete, made of broken pumicestone, puzzolana and lime, this dome being in one solid mass; the walls and dome are still intact. The Colosseum, finished in 79 A. D., was almost wholly built of this concrete. Later structures were built by the Romans and also by the Moors, as many Moorish palaces along the shores of the Mediterranean bear testimony.

Charles Tomlinson, F. C. S., gives the first definite explanation of the hydraulic properties of puzzolana and lime. He states that puzzolana has a strong affinity for the hydrate of lime, and when they are ground together will set under water and become insoluble. In consequence of the affinity existing between the hydrate of lime and puzzolana, he states, "that the concrete thus formed is extremely hard is evident from the early Roman remains which exist for our instruction. The mortar is in many cases more solid than the brick. While the brick has receded by the wearing away of the elements, the mortar still projects beyond it in its original form and strength."

The scoria found at Puzzuoli and neighboring towns near Rome varies largely in its chemical analysis, although it all contained lime, silica, alumina, iron, magnesia, potash and soda. A German chemist was the first to notice the close similarity between the volcanic ash used by the Romans and the slag from certain blast furnaces. He conceived the idea that if such excellent cement could be made from puzzolana, an equally good quality of cement might be made from blast furnace slag and began experiments along this line. The early experiments were not very satisfactory, but as a more complete knowledge was gained of the peculiarities of the materials a very excellent cement was finally made, and is to-day recognized in Germany as a staple article. The principal difference between the puzzolana and slag is that nearly all blast furnace slag carries a higher percentage of lime than the puzzolana. This, of course, is an increased advantage, as less hydrated lime had to be added to make a strong cement.

### The Slag Cement Industry in this Country.

The industry of manufacturing cement from slag in the United States has made great strides in the last 10 or 12 years, until to-day the cement used is far superior to that made in Germany, France or England. This is largely due to the perseverance of one man. Starting with only second-hand information as to what was being done abroad, he began experiments which for years seemed only to presage defeat, but the cause of one

fault after another was discovered and eliminated until to-day the cement made in this country compares favorably with the best brands of Portland cement for at least 90 per cent. of all the work for which cement is used.

A business, as well as a man, can be more injured by fool friends than all the open enemies that can be gathered. When the slag cement industry was in its infancy some few mills were started by those who could only see enticing profits, but who neither understood the proper requirements for the raw material nor the proper manipulation of it. As a consequence, a product was manufactured which should never have been put on the market at all. Some of it was sold as "Portland cement" for Government use in Louisiana, and it failed entirely to fulfill the requirements. It was rejected, and its use for further Government work was condemned. This was a blow from which it took several years to recover, and that condemnation is still used as an argument against the use of slag cement by those who are either ignorant of the present conditions or who are not disposed to fight fair.

#### The Government Report on Hydraulic Cements.

On December 17, 1900, a commission was appointed by the Chief of Engineers of the United States Army, approved by the Secretary of War, to draw up specifications and rules to govern the use of all kinds of cement for work under the War Department's supervision. A report on this was made June 6, 1901, and a most excellent and thorough report it proved to be. It set a high standard for all cements, and is to-day considered authority for all Government, State and municipal work throughout the United States. It withdraws the condemnation of slag cement previously made by the engineer in charge of the Louisiana work, which condemnation was not official, and it frankly admits slag cement for Government work under proper conditions. Aside from the general specifications, which are the same for slag and Portland cements, such as dryness, condition of package, form for bids, &c., the following requirements are given:

1. That it shall be branded Puzzolan. 2. That it shall weigh at least 330 pounds per barrel. 3. That it shall be ground to a fineness so that 97 per cent. shall pass through a standard 100-mesh sieve. 4. That the specific gravity shall be between 2.7 and 2.8. 5. That the initial set shall be not less than 45 minutes and the final set not over 10 hours. 6. That the tensile strength neat shall be at least 350 pounds in 7 days and at least 500 pounds in 28 days, and that briquettes made of 1 part cement to 3 of sand shall develop a tensile strength of 140 pounds in 7 days and 220 pounds in 28 days.

Under headings "Slag Cement" and "Proper Uses of Puzzolan Cement," the report says:

Puzzolan cement properly made contains no free or anhydrous lime, does not warp or swell, but is liable to fall from cracking and shrinking (at the surface only) in dry air.

Mortars and concretes made from Puzzolan approximate in tensile strength similar mixtures of Portland cement, but their resistance to crushing is less, the ratio of crushing to tensile strength being about 6 or 7 to 1 for Puzzolan and 9 to 11 to 1 for Portland. On account of its extreme fine grinding, Puzzolan often gives nearly as great tensile strength in 3 to 1 mixtures as neat.

Puzzolan permanently assimilates but little water compared with Portland, its lime being already hydrated. It should be used in comparatively dry mixtures well rammed, but, while requiring little water for chemical reactions, it requires for permanency in the air constant or continuous moisture.

Puzzolan cement never becomes extremely hard like Portland, but Puzzolan mortars and concretes are tougher or less brittle than Portland.

The cement is well adapted for use in sea water, and generally in all positions where constantly exposed to moisture, such as in foundations of buildings, sewers and drains, and underground works generally, and in the interior of heavy masses of masonry or concrete.

Under general remarks on cement, the report says:

It appears to be reasonably well established that cements exhibiting great activity give, after long periods, results inferior to those with action less rapid.

In the opinion of the board the two periods most generally adopted, 7 and 28 days after mixing, are, on the whole, the best. The one-day test, though of some value in a discriminating sense, should not be placed in the same category as the other periods named.

A cement which tests moderately high at 7 days and shows a substantial increase to 28 days is more likely to reach the maximum strength slowly and retain it indefinitely with a low modulus of elasticity than a cement which tests abnormally high at 7 days with little or no increase at 28 days.

Of two or more cements offered for use or on hand, the ce-

ments that stand the boiling tests are to be taken preferably; it should be constantly applied on the work among other simple tests to be noted, for although the boiling test sometimes rejects suitable material, it is believed that it will always reject a material unsound by reason of the existence of active expansives. Sulphates of lime, while enabling cements to pass the boiling tests, introduce an element of danger.

In determining the minimum requirements for cements given in the subjoined specifications, we recognize that many cements that attain only fair strength neat and with sand in a short time and show marked gains of strength on further time will fulfill the requirements of the service, and that unusually high tensile strength attained in a few days after gauging is often coupled with a small or negative increase in strength in further short intervals. Unusually high tests in a short time after gauging should be regarded with suspicion.

All these remarks are extremely favorable to slag cement, for its characteristics are slow setting, high sand carrying capacity and absolute freedom from free lime, which causes cracks and which is shown by the boiling test.

#### Great Advances Made Since.

Since this report was published, four years ago, a great advance has been made in the manufacture of slag cement, principally in the manipulation of the slag in granulation to eliminate sulphur. Were another report to be made to-day by the same engineers there is no doubt they would be more generous to the slag cement than they were four years ago. Many thousands of barrels have been used since then by the Government and various municipalities and it has given nothing but uniformly good results. The writer has seen within the last month sidewalks and buildings of stucco which have been exposed to two most severe winters and one summer of unusual dryness and heat with no signs of deterioration.

As a matter of fact, all the principal works to-day manufacturing slag cement exceed in every particular the requirements set forth by the Government engineers. The fineness is between 98 and 99 degrees through a 100 mesh sieve. The specific gravity and time of setting are both within the limits prescribed. The neat test will average more than 450 pounds in 7 days and fully 600 pounds in 28 days, while the 3 to 1 mixture will average more than 200 pounds in 7 days and more than 300 pounds in 28 days.

About the only argument which is now used against slag cement is that it is not a true Portland cement, because it has never been calcined and the elements fused together. This might be answered by the statement that at last four-fifths of it has had the most intimate fusing possible in the furnace, but why get into an academic discussion over the point at all? All that is necessary is that the cement does its work and it is fully proved that it does. Is Bessemer steel any the less useful for rails, plates and structural shapes because it is not a tool steel and cannot be tempered?

## CORRESPONDENCE.

#### The Rothe Erde Works a German Enterprise.

To the Editor: In the issue of *The Iron Age* of April 20 we note an article entitled "Broad Movements in the Belgian Steel Trade." In this article we are represented, under the title "Aix la Chapelle Iron Works," as having been a works in the hands of Belgians which went into the hands of Germans only after the fusion with the Gelsenkirchener Bergwerks-Actien Gesellschaft.

We beg you, in order to clear up the situation, to point out the fact that the works were founded in 1845 by citizens of Aix-la-Chapelle, and that the company has always been and remained a company working with German capital; that it was the German Aachener Huettten Actien Verein which in 1893 bought the blast furnace plant at Esch (Luxemburg), which was in the hands of parties from Luxemburg and Belgium, and that furthermore it bought in 1903 the furnace plant at Deutsch-Oth (Lorraine), which was owned by Belgians. The company, therefore, did not need to pass into the possession of Germans.

AACHENER HUETTEN ACTIEN VEREIN.

ROTHER ERDE, NEAR AACHEN, May 1, 1905.



## Dock Stocks of Ore Very Low.

DULUTH, MINN., May 13, 1905.—The ore movement down the lakes is progressing so quietly and steadily that little is heard of it. This is what men at the head of affairs like. If there is no noise there is no disturbance, and disturbance means delay. In spite of the ice troubles in April there were shipments during the month of 1,200,000 gross tons, of which 775,000 were from Minnesota. Now business is going on at a far better rate than even during the closing days of April, and the movement for May will surprise the trade. The statistics as to ore on Lake Erie docks May 1, showing a total of only 2,271,000 tons, have had their effect upon the conduct of the lake trade, and every nerve is now strained to provide a good tonnage for the early months of the season. This volume of ore upon dock is less than in any year in the history, when the relative proportions of ore consumed are considered, and actually less than for any year since 1900. The figures show that there have been sent to furnaces in the year from May 1, 1904, to date a total of 20,150,000 tons, and this may be considered the consumption of lake ore by the furnaces along the Erie shore and the region fed therefrom.

### Section 30 Explorations.

The diamond drilling that has been going on at "Section 30," T 63-11, for more than two years has been stopped, and it is now announced that a deep exploratory shaft will be sunk, probably to the depth of 1150 feet. It has been determined that the exploration by drills is not satisfactory. Two years ago last January an option for lease on this famous tract was taken by D. E. Woodbridge for F. H. Clergue, and work was carried on for some months by Mr. Woodbridge. Part of the time three drills and a sinking crew were engaged in the work, and it was continued until ore had been shown in two holes and a major portion of the various tracts included in the ground was determined valueless. It was then found that explorations would be far more difficult, expensive and slow than had been expected, and that drill work could scarcely be hoped to show the ore body successfully. These facts, coupled with the financial troubles of the Lake Superior Consolidated Company then impending caused the release of the option and the retirement of Mr. Clergue from the undertaking.

The option was taken over by Geo. N. Longstorf, one of the fee owners, and he has been maintaining—first three, then two, then one, drill upon the ground until quite recently, when the last machine was taken off. The cost of exploration carried on by the two interests cannot have been less than \$140,000. United with this is not much less than \$1,000,000 that has been spent in litigation over the property, all before the first drill was taken in. One of the litigants not long ago asserted in a petition to the Justices of the United States Supreme Court that his expenses in connection with this land had been about \$400,000, and he was but one of several. While the great success that had been hoped for has not been met with in the exploration of this remarkable tract, it is by no means condemned, and the present exploring syndicate states that it has found ore in considerable quantity, but that it is very difficult to determine the extent of the deposits, as it is impossible to get into it with drills. This is the identical difficulty that was found two years ago by the former explorers, and which was one of the causes that led to their abandonment of the enterprise. Probably no tract of land in the Lake Superior region ever presented the attractions to the explorer that section 30 did, because of the splendid surface showings of iron and jasper and the basin-like appearance of the surrounding greenstone rocks.

### New Plan of Mining Ore.

M. A. Hanna & Co. will operate the siliceous ore body of the Richmond mine, Cascade range, very heavily this year, and will inaugurate a plan of mining new to that section. The mine is stripped and is a large deposit of hard ore. At present there is a face of ore in the slope 70 feet high. This will be drilled down from the top and the hole broken out with explosives, throwing an

immense amount of ore down into the pit, crushing it somewhat and loosening a large tonnage at low cost. The ore will then be crushed in a centrifugal crusher now going in and shipped to Marquette docks. A loop track has been put in and ore will be trammed by power from the pit to above the railway cars for loading. The size of some of these bodies of lean ore on the Cascade range has never been properly appreciated except by a few companies. This Richmond, for instance, is, so far as can be told, a solid 40 acres of ore, extending to a depth that is not known, for no effort has ever been made to drill it through. The Oliver Company's Moore mine, near by, is of enormous size, and in neither of them is there surface enough over the ore to make it a difficult matter to strip them.

### General Mining Activity.

There is renewed interest in lands near Biwabik that had been considered of little value until recently. The finds of G. A. St. Clair on lands belonging to the Hale Mining Company, and just south of the old open pit, which has been abandoned as worthless, have affected others, and now exploration has commenced on other lands nearby. The Oliver Iron Mining Company is putting drills into lands it holds east of the Hale, and the old Kanawaha, abandoned some time ago, is to be re-explored. Other tracts in this vicinity that had been condemned will be reopened and examined. Drills have been started south of the Biwabik deposit on old Cincinnati lands, where it had not been supposed the ore existed. The Biwabik district has been suffering from neglect and there has been a general supposition that the small deposits found there and mined out were all there was of the immediate properties thus mined. It now seems to be different.

The old Saginaw mine at Norway, Menominee range, has been reopened by John T. Jones, acting for himself and P. L. Kimberley. This mine was operated in the early days of the Menominee and was closed permanently in 1890, since which time it has been full of water. Recently Mr. Jones got into the old workings and did some work that disclosed a promising condition of things. He has now placed machinery on the ground and will develop rapidly. This makes three or four properties on this range and the Cascade that he has under development, and he is exploring others.

Corrigan, McKinney & Co. are negotiating for an exploring option on the remaining lands of the Longyear Mesaba Land Company in 58-15, near the mines that have been discovered around Aurora.

Jones & Laughlin are preparing for a far larger mining business than they have ever done, and are now to sink a deep shaft at the old Rolling Mill mine, Negaunee. They expect to go down 800 feet, and have so thoroughly tested the ground that they are assured there is good ore at that depth. The mine was a Sellwood property for a couple of years and known as the Chester, but is held in fee by Capt. S. Mitchell.

At Negaunee the Maas of the Cleveland Cliffs Iron Company, which has been under development for three years and more, is now almost ready to mine ore. Drifting has been started from the shaft at the depth of 700 feet, and it will be pushed to the ore, which, though it lies at some distance from the shaft, is in large quantity and of excellent quality. This mine will be developed rapidly into a large producer. It has required more nerve and money to open this property than almost any other mine that was ever undertaken on Lake Superior. D. E. W.

The Atlanta News for May 9 contains a leading editorial commending Jenkins Bros., valve manufacturers, 71 John street, New York, and their representatives, Arthur Langston and Charles W. Martin, for introducing reforms in the entertainment of customers at conventions, having reference particularly to the refined methods employed by them at the recent Savannah convention of the Southern machinery and supply trade.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, is preparing plans for the erection of a large office building in that city.

# THE IRON AGE

1855-1905.

New York, Thursday, May 18, 1905.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
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## Cross Currents in Iron Consumption.

The growth of iron and steel consumption in the United States presents a wonderfully complex system of cross currents and eddies in the grand onward flow toward greater and greater total tonnages. The general current may be regarded as a function of the increase in population, the increase in consumption in old uses and the advent of new uses.

The increase in total consumption has been so rapid that any cursory glance scarcely catches a glimpse of the cross currents and eddies. If one eliminates the increase which is due to the increase in population by reducing consumption to a per capita basis these minor movements become more apparent but still are not striking. It is only by comparing them with each other that their rapid relative movement can be made really obvious. Thereupon it becomes clear that the consumption of some forms of iron and steel, formerly leaders, has fallen behind, while other and newer forms have taken relatively very important positions. By this means it can be discerned that rails, at one time by far the most important iron and steel product, have become relatively much less so, while such light lines as wire, sheet products, hoops and bands, &c., have become very important.

A comparison must have two basing points, and it seems well to select, for comparison with the present, the year 1890, a year of general prosperity and one which brought out a pig iron production close to the maximum capacity, a production which was not excelled until five years later. With one exception, this is the longest period for half a century in which one year has retained the banner for record pig iron production.

The production of pig iron in 1890 was 9,202,703 gross tons. Naturally the production in the present year cannot be estimated, but an assumption can be made which will do well enough for the present purpose. Production during March and April was at the rate of 23,400,000 gross tons annually; a continuation of this rate for the balance of the year would give a total of 22,900,000 tons, while a continuation of the average rate of the first four months would give a total of 22,000,000 tons. It will do no harm to assume—not estimate—the production for this year at 22,000,000 gross tons.

From 9,202,703 tons in 1890 to 22,000,000 tons in 1905 is an increase of 139 per cent., sufficient to obscure most if not all minor movements in a cursory survey. By eliminating the influence of increased population the real increase in iron consumption by the people themselves is made more apparent. The population in 1890 was 62,622,250, and may be estimated at 83,142,000 the middle of this year. The per capita production of pig iron in 1890 was 329 pounds, and in 1905 may be assumed at 593 pounds.

Next, it is possible to eliminate roughly the influ-

ence of imports and exports. Reducing the imports and exports, in whatever form, to the approximate amount of pig iron it would require to make them, it appears that in 1890 the net imports amounted to about 25 pounds of pig iron per capita. The balance of trade has since changed in sign, so that in this year the net exports may be assumed at about 31 pounds per capita. Accordingly, the per capita consumption of pig iron in the United States has increased from about 354 pounds in 1890 to about 562 pounds in 1905, an increase of 59 per cent.

An increase in production by the country of 139 per cent. compared with an increase in the rate of consumption by the populace of only 59 per cent. shows a difference which is surely striking enough to justify the study of the subject which is here presented. That the real increase is so much less than the bare figures of production would indicate should be a comfort to the iron industry and a guarantee that the present rate of production is not necessarily out of place.

Endeavoring now to take a look at some of the cross currents in the matter of iron consumption, railroad materials naturally present themselves first. The production of iron and steel rails in 1890 was 1,885,307 gross tons, which, less exports of 16,947 tons and plus imports of 204 tons, indicates an approximate consumption of 1,868,564 gross tons. The consumption this year is likely to show an almost negligible increase over this figure, probably considerably less than a fourth. New railroad building in 1890 was reported at 6344 miles, while the net increase in mileage during the year was reported at 5378 miles. For the current year the results promise to be not much different as to mileage from those for 1890. The increased consumption of rails can easily be attributed to the laying of heavier sections and the necessity for more rapid replacement, but it is easy to see that such increase is not nearly as great as it should be, relative to traffic, inasmuch as the number of tons of freight carried by railroads one mile was reported for 1890 at 79,192,985,125, while the figures for this year can easily be set at above 180,000,000,000, an increase of 127 per cent. It takes a much greater tonnage of traffic, then, to wear out a ton of rails than it did 15 years ago, a cross current of no mean significance when it is recalled that so many statements have been made, in various connections, that, on account of poorer quality, rails do not give as good service as they formerly did. In passing, it may be remarked that the ton-miles of freight moved per capita was 1265 in 1890 and will be between 2100 and 2200 this year.

In 1890 the tonnage of rails consumed was one-fifth the tonnage of pig iron produced; this year the tonnage of rails consumed will probably be less than one-tenth the tonnage of pig iron produced.

The railroads are less important users than formerly of structural material for small bridges. The important roads are replacing girder bridges with stone and concrete construction. On the other hand, the elevation of tracks in crowded municipalities constitutes practically a new use for structural steel and involves large tonnages.

The railroads have only commenced a comprehensive movement whereby the bulk of wooden cars now in service will be replaced by steel cars. This movement has probably not yet reached its full force. The point of maximum consumption will probably be reached some years hence, and when the replacement movement is fairly well accomplished a decline will naturally set in, quite comparable to that which occurred in rail consump-



tion after the railroad industry passed the high point of new building in 1887, that year seeing a record for rail production which was not reached again for a dozen years. This will make a noteworthy cross current. Still further in the future is the steel railroad tie, which, if regularly adopted, will show tonnages which no other branch of consumption can possibly attain.

In 1890 no tin plate was made in the United States. The average imports for domestic consumption in that year and the immediately preceding and following years were 260,000 gross tons, or 9.3 pounds per capita; in 1904 the domestic production for ultimate domestic consumption was approximately 480,000 gross tons, or 13.1 pounds per capita; in the first half of this year it is running at the rate of about 800,000 tons per annum, or 21.6 pounds per capita. The per capita consumption of black and galvanized sheets has shown a somewhat similar increase, but as the country was self supporting in 1890 production has shown no greater increase than consumption.

The production of cut nails and spikes reached a maximum in 1886, with 8,160,973 kegs of 100 pounds, of which 64 per cent. was iron nails; in 1890 the production of steel cut nails had slightly increased, while iron cut had greatly decreased, resulting in a total of 5,640,946 kegs, of which only 32 per cent. was iron. In 1903 the production of cut nails and spikes dropped below 1,500,000 kegs, and the production is probably still less now, while the proportion of iron is quite small.

The production of wire nails has grown very rapidly. In 1886, the year of maximum cut nail production, only about 600,000 kegs of wire nails were made; in 1890 production had increased to 3,135,911 kegs; two years later, in 1892, the production of wire nails first exceeded that of cut nails; in 1902 production first passed the 10,000,000-keg mark, and is now well above that figure.

The growth in wire nail production is only an index of the expansion in all wire products. In 1890 the production of wire rods was 457,099 gross tons, or barely one-fourth as great as the rail production. In 1902 the rod production of 1,574,293 tons was more than half the rail production of 2,947,933 tons. This year rods will show an increase from 1902, while rails will show a large decrease. It is clearly but a matter of a few years until the production of wire rods will exceed that of rails. In the past two or three years about one-tenth the wire rod production has been exported, either as rods or as more finished material. In periods of depression in the rail trade rail exports reach much more important proportions.

The consumption of heavy bands has increased very rapidly. In the manufacture of an immense variety of shelf and other hardware the steel band has been found a great convenience. The hardware manufacturer receives his material from the mill with two dimensions formed: a single shearing operation furnishes a blank, and the waste is very small, being merely the crops from long pieces from which many blanks have been cut. Possibly of no other rolled form of steel has the consumption increased so rapidly in the past two or three years.

Of all the cross currents formed by varying production of the different forms turned out by the rolling mill, the majority appear to be currents in the direction of increased prominence for the lighter lines. Sheets, tin plates, wire products, hoops and bands are all coming to constitute a greater percentage of the total steel product. The consumption of such lines is more widespread than that of the heavy lines. Steel is entering more into the daily life of the people in all sections of the country.

### The National Deficit Problem.

Washington advices state that the Secretary of the Treasury has begun to feel considerable anxiety with regard to the national revenue. He is confronted with the certainty that the Treasury ledgers will show a deficit of at least \$25,000,000 for the fiscal year ending June 30 next, together with the prediction of the Actuary of the Department that the revenues for the next fiscal year will fall quite as far short of the expenditures. The majority leaders in Congress are convinced that steps must be taken in the early future to provide \$25,000,000 or \$30,000,000 additional, and a movement is on foot among the members of the Senate Finance Committee to secure this revenue without any general overhauling of the tariff schedules. The interesting semiofficial announcement has been made during the past week that the President will call Congress together on October 16 and that in all probability the revenue question, as well as the problem concerning Federal control of railroad rates, will be considered at the special session.

A month ago it seemed probable that the receipts from customs and internal revenue for the months of April, May and June would so far reduce the current deficit as to bring it below \$20,000,000 before July 1. The receipts from both these sources, however, have been disappointing, and to-day, with a shortage of approximately \$35,000,000, it seems very doubtful that the surplus during the next six weeks will serve to cut down the balance on the wrong side of the ledger below \$20,000,000 before the end of the fiscal year. On July 1 there will be very heavy withdrawals of cash, while the receipts for the ensuing quarter will be relatively small. The Secretary of the Treasury has already held a number of conferences with prominent Senators concerning the best method of raising additional revenue.

The majority leaders of both Senate and House are said to be divided upon the question as to how the current deficit should be met. One wing of the party advocates a very general readjustment of the tariff, including such reductions in the principal schedules as would stimulate imports to a point that would net all the revenue desired. The other wing, and at this time by far the most numerous and influential, strongly opposes any general revision of the tariff, and especially the reduction of duties on manufactured articles. It is putting forward a variety of remedies for present conditions in the Treasury, including increased internal revenue taxes, the readjustment of the laws relating to distilled spirits, the assessment of a duty on coffee and tea, &c. Senators who favor this method of raising additional revenue point to the fact that the recent war revenue tax on beer did not affect the price paid by the consumer, and the same argument is made with reference to cigars and manufactured tobacco. As recently stated in these columns the Commissioner of Internal Revenue now has before him a project of much importance to the manufacturers of the country in the shape of a comprehensive bill providing free alcohol for industrial uses, reducing the rates on distilled spirits and increasing the charges on compounded or rectified spirits in such a manner that the aggregate revenues from these sources would probably exceed the present collections by nearly \$30,000,000. If the results of the passage of such a law could be guaranteed it is said to be more than likely that this method of meeting the current deficit would be promptly adopted. In any event it will have very careful consideration, especially if the Commissioner of Internal Revenue should give the project his indorsement.

The assessment of a strictly revenue duty on certain

food products, including coffee and tea, is a plan now receiving careful attention, and one which is favored by certain Senators and Representatives who have made a study of the needs of our insular possessions. The project of levying a duty of 5 cents per pound on all coffee, except that imported from our dependencies, which is to remain free, is advocated as certain to produce \$40,000,000 to \$50,000,000 additional duty at the outset and as affording a tremendous stimulus to the coffee raising industry in the Philippines, Hawaii and Porto Rico. A duty of 10 cents per pound on tea produced more than \$10,000,000 per annum during the Spanish war, and a similar duty on spices levied at this time would net about \$5,000,000. It goes without saying that any plan involving the transfer of food products from the free to the dutiable list will encounter a great deal of opposition, although the experience with the tea duty in 1898 demonstrated that at least one-half the tax is paid by the foreign exporter, who is obliged to reduce the price of his product in order to prevent a heavy shrinkage in consumption.

The developments in the solution of the problem will be of very great interest to both those manufacturers who deprecate any reduction in the duty on products competing with theirs and those who care far less for such action than they do for legislation which may assist them to hold or gain foreign markets for their goods.

### The Anti-Trust Laws.

Ever since laws were made, the liberties of the well-disposed have been curtailed by the abuse of liberty on the part of the evilly disposed. Recent enactments, national and State, against trusts, combinations and price agreements illustrate this point. While competition may be the life of trade, unwise competition has been the death of many an enterprise and has been so injurious to industrial and commercial progress that certain forms of combination, co-operation and association became imperative for self preservation. Harmless at first, from the standpoint of the consumer, some of these consolidations and associations began to abuse their power by unwarranted advances in prices or by unjust and tyrannical treatment of outside competition. Then the law makers stepped in and declared all combinations and agreements in restraint of trade to be unlawful or even criminal. If all anti-trust laws now on the statute books were to be enforced the thousands of members and officers of the hundreds of associations that now regulate prices on iron, steel, hardware and other products would be made defendants to civil or criminal actions. It is not in the province of the men whose duty it is to enforce the law to decide which are good and which are bad associations or combinations; so that every manufacturer who attends a meeting that votes to fix a price on a commodity is technically a law breaker, and liable to arrest and punishment; and every secretary or commissioner who sends out a notice of a price agreement makes a confession over his own signature that he has been the principal or a party to an illegal if not a criminal act. The condition is not a healthy one, as obedience to law is one of the cardinal prerequisites to good citizenship. Perhaps in the fullness of time wisdom will be given our law makers that will enable them to devise statutes that will permit co-operation for self protection while they forbid conspiracy to exact tribute.

The report that the South Sharon plant of the American Sheet & Tin Plate Company had received another rush order from the Japanese Government for 30,000

boxes of tin plate is untrue. Several months ago such an order was placed with this plant, but it was filled in a short time from stock.

### The Decalcomania Industry in America.

Prior to 1894 all decalcomania transfers for decorating machinery, wooden ware, china, carriages and implements of all descriptions were imported from Europe, but in that year the bicycle fever had started and a great deal of inconvenience was caused by having to purchase decorations thousands of miles away.

G. R. Meyercord then saw his opportunity and started in Chicago the only American manufactory of decalcomania transfers and was able to furnish the bicycle manufacturers with decorations on short notice. After a few years the bicycle boom died down, but in the meantime the Meyercord Company had added numerous other departments for handling decalcomanias in all branches, including china decorations, and now practically all American potteries depend on this company for their transfer ornaments. Meanwhile, the company has grown from a small concern, with a force of perhaps a dozen men, in 1894 to a great manufactory requiring the services of 500 people, the greater portion being high salaried skilled artisans. It requires a staff of fifty artists to produce the original designs required.

The Meyercord Company has of late years been brought very prominently into the advertising field by the introduction of its opalescent decalcomania transfer window signs, which enable manufacturers to place their trademark, picture of goods or any design, most artistically executed, on their dealers' windows, changing the cost from dollars to cents, as compared with hand work. In many other forms of advertising the advertiser must pay for space, but with these the dealer supplies the space free of charge, and once the sign is placed it will last for years, as the window protects it from exposure. The company furnishes original sketches free.

The Meyercord Company's office is in 1108 Chamber of Commerce Building, Chicago. Its factory, which can be visited on application at the office, is situated in one of the suburbs of Chicago, away from the smoke and grime of the manufacturing district, where vibrations and disturbances would destroy the delicate register of the presses. In going through this factory one of the most interesting things to the sightseer is the china department, where thousands of dollars worth of mineral colors are stored, many costing hundreds of dollars per pound. These colors are dusted by hand over an invisible gummed design, placed on gummed paper by presses which must register to the one one-thousandth part of an inch; in fact, these presses must work as true as the finest watches. The atmosphere of the room must be kept to a certain degree of humidity or the gummed stock will shrink or stretch, thus destroying the delicate impressions. Another place of interest is the large pressroom where the window signs are printed. In a great many cases the same color is printed five or six times in succession on the same sheet to give body to the work, because when these are transferred to a window the paper is removed, leaving nothing but the color on the glass, and a great deal of body is needed to give the hand painted effect. Among other departments of great interest are the wood panel department, where the famous Meyercord wood panel signs are made, the artists' department, the engravers' department, the stone etchers, the china kilns, where tests are made; the aluminum leaf department and the paper department, where the special gummed stock is prepared.

This company is now producing decalcomanias of such quality that its products are in demand in foreign markets. Customers are supplied, in fact, in all civilized countries.

The Universal Roller Cotton Gin Company has been incorporated with a capital of \$5,000,000. The company will put on the market a new cotton gin which will be made in Southern shops. Ralph Starrett, 49 Wall street, New York, is connected with the company.



## The Scotch Iron Situation.

GLASGOW, April 28, 1905.—The situation in the pig iron market here cannot fail to be of interest to Americans because of the extent to which it has been brought about and is affected by the situation in America. In the two closing months of last year there was quite a boom in Cleveland warrants in consequence of the impression which prevailed that the enormous growing consumption in America would compel large purchases of foundry iron as well as of steel making iron on this side. Thus it was that at the close of 1904 Cleveland warrants had risen to 51 shillings 2 pence, Scotch warrants to 53 shillings 9 pence and Cumberland hematite warrants to 57 shillings.

### American Orders Failed to Materialize.

But the expected flow of American orders for ordinary iron has not occurred, and what orders have come from America have been for special qualities—such as spiegel-eisen and hematite—that have not affected the warrant position. On the other hand, the cessation of the shipments of American steel bars and billets to this side has improved the position of our own steel making iron, which steel manufacturers have had to buy more freely in the absence of the former liberal supplies of crude steel. In the interim there has been considerable activity in warrants, and the transactions from day to day have been large compared with what we have become accustomed to of late years, and at the time of writing Cleveland warrants are 51 shillings 6 pence; Scotch, 54 shillings 2 pence, and Cumberland 58 shillings. It is evident, then, that those who bought for a rise during the boom at the close of 1904 have been disappointed.

It is evident also that the market has assumed a new speculative position, inasmuch as the price for futures (three months) is 1 shilling per ton below the price for cash warrants. The latter have got into the hands of a bull clique, which is forcing the pace on the bears. When it ceases to operate prices drop, and thus it is that while present quotations are as above noted, the fluctuations are about 1 shilling per week. For instance, last week Cleavelands dropped to 49 shillings 9 pence and recovered to 50 shillings 9 pence. So high is No. 3 iron in consequence of the bull movement in warrants that ordinary commercial transactions in this quality have practically ceased for the time being and the shipments of it have stopped. All that can be obtained from the furnaces is being hurried into the warrant stores, either to cover sales of futures as they mature or to convert into cash warrants. In consequence there are now some 390,000 tons of Cleveland ordinary iron in the warrant stores, as compared with only 191,827 tons at the end of 1904, and iron is still being rushed into the stores at the rate of 10,000 to 12,000 tons per week.

Thus, then, it will be seen that the boom in America has caused a bull movement here which has brought about a large and

### Growing Increase in Our Warrant Stocks.

It has even affected the stocks of Scotch G. M. B., of which only 12,000 tons were in store at the end of 1904. At present there are 23,000 tons in the Glasgow warrant stores, though it is necessary to state that some 5000 tons of the warrant stock now held here consists of English Midland iron. This iron is not only coming forward for our founders in place of the Cleveland foundry iron, which they usually buy, but which has been made too dear by the speculation in warrants, but it is also coming forward to be available under the new warrant for standard foundry iron. In this warrant a large business is now being done, and the present price of it is 47 shillings 6 pence, or, say, 4 shillings per ton under Cleveland No. 3. The virtue of it is that it covers iron lying in approved stores in Glasgow, Middlesbro, Manchester, Liverpool, and at Ellesmere Port for the Midlands. The disadvantage of it is, for the consumer, that he does not know what iron he may get under it from a great number of English and American brands. The list of American brands available under this warrant has lately been increased by the addition of Sheffield, Pioneer, Sloss, Lady Ensley, Ensley, Eureka, Vanderbilt, Woodstock, Wood-

ward, De Bardeleben, Chattanooga, Rockwood, South Pittsburgh and Embreeville, all in addition to the various American makes whose analyses had been accepted by the Committee of the Pig Iron Trade Association, for the price of the iron actually delivered under this warrant is graded by brand or analysis in certain defined proportions to the price of No. 3 Cleveland warrant iron.

One effect of the creation of this warrant has been to bring iron from the Midlands of England for storage in the Glasgow iron warrant stores. Another effect may some day be to bring American iron to our stores for conversion into warrants.

### Shipbuilding and Engineering Industries Easier.

The strength of our market for manufactured iron and steel rests for the present on the activity in the shipbuilding and engineering industries. But there is now ease in both—that is to say, the large demand for new ships with which the year opened has ceased, and it was not a demand which reached all the shipyards. Moreover, with regard to contracts for new ships actually booked, the buyers are in many cases negotiating to have building delayed, and some contracts, it is said, have been canceled altogether, the purchasers being more inclined to pay penalties than to face the depressed freight markets. It is not likely that there will be any renewed demand for ships until either freights improve or costs decrease, or both.

But this is the moment chosen by some of the trade unions to obstruct business by demanding immediate advances of wages. The pattern makers began it with a demand of an advance of  $\frac{1}{2}$  penny per hour, which the engineer employers declined to grant because there has been no sufficient improvement in trade since the last wage agreement was made. Whereupon the United Pattern Makers' Association, without asking for a conference, declared a strike and their members left work last week. This association does not include all the pattern makers, for some are members of the Amalgamated Society of Engineers. But the Amalgamated Society of Engineers has also put forward a demand for an advance of  $\frac{1}{2}$  penny per hour to all its members in this district, where the principal employment is in marine engine shops, but where also there is an immense variety of engineering industry.

The advance, the machinists claim, is a restoration of  $\frac{1}{4}$  penny per hour taken off their wages in 1903 and an addition of another  $\frac{1}{4}$  penny, making  $\frac{1}{2}$  penny in all. This would bring them above the rate fixed in the boom which followed the great strike in 1898, when the trade was very much busier than now. The Federated Engineering Employers have, in local conferences with the Amalgamated Society of Engineers' representatives, pointed out that present contracts were founded on existing wages and that an advance in wages would result in loss. But the demand for the advance is maintained, and the next step is to refer it to a central conference of the executive councils of the Federation of Engineering Employers and of the Allied Trade Unions. Of the Allied Trade Unions the Amalgamated Society of Engineers is the chief, and the Amalgamated Society of Engineers has not only by a recent new set of regulations divested its Executive Council of its former controlling powers, but has also decreed that no overtime shall be worked by its members in any district in which there are unemployed members. This resolution as to overtime is at variance with the terms of settlement made by the Executive Council with the employers in 1898, so that the situation is full of difficulty and danger.

To add to the gravity of the situation the Federation of Trade Unions in the Shipbuilding and Engineering Trades has put forward a demand that all the Clyde shipbuilders shall adopt a system of weekly pays, which a few years ago was proved by experiment to be wasteful and undesirable (because of the time lost after every pay day by the dry throated members of the black squad) and which the Federated Shipbuilding Employers have resolutely determined not to try again. So that at the present writing we are on the verge of very serious labor troubles, which if they occur will not be confined to this district.

B. T.

### The Minimum Wage in Great Britain.

LONDON, April 29, 1905.—In a leading article in *The Iron Age* of March 30 reference is made to an attempt to procure by legislative means a system of minimum wage in Great Britain. Undoubtedly the principle of minimum wage, if adopted, would mark a new era in the relations between employer and employed. Nevertheless, signs are not wanting that the minimum wage is likely to become in the near future a prominent plank in the political programme of the Labor party. A short article on the subject may prove interesting to American readers. I will endeavor in what follows to state the case as it has been given to me by one of the foremost advocates of the principle:

#### State Intervention in Labor Matters.

It is difficult to convey to American readers the almost fundamental difference in legal industrial policy between this country and America. But if we are adequately to realize the real purpose of the advocates of the minimum wage it is first of all necessary to understand that in Great Britain there is not the same objection, either on the part of employers or employees, to State intervention. In America it is assumed that the two sides in the labor problem can most satisfactorily adjust their differences without resort to State machinery. In Great Britain *laissez faire* is dead or dying. The great commercial magnates have, during the past ten years or so, radically changed their point of view in regard to the function of the State as it affects industry. Men of middle age—aged, say, from 35 to 45—started their commercial life on the assumption that the State must not interfere in industrial affairs; that it must stand by and see fair play between employers and employed.

Since our school days, however, much water has run under the bridge. Employers have increasingly demanded the co-operation of the Government in various commercial and industrial directions, while employees have with equal celerity abandoned their old individualistic basis and unblushingly asked Parliament to do for them a great variety of services which formerly they did for themselves by private negotiation. Thus, rightly or wrongly, and as a mere matter of historical fact, State intervention in industry is accepted as inevitable in Great Britain.

#### Minimum Wage and Wage Regulation.

I asked my informant what he meant by a national minimum wage, and he replied: "A national minimum wage may be defined as that necessary to maintain a worker and his family in healthy existence so that he and they shall not degenerate, but not necessarily that they shall progress (at least without great care and frugality), or it may be limited to the maintenance of the worker alone." It is further desirable to differentiate between what we understand as a minimum wage and "wage regulation." This latter exists to-day in a variety of ways and would continue to exist whether a minimum wage were established or not.

On asking the gentleman in question (a well known author and politician) what generally is the case for a minimum wage, he said: "At present we enforce a minimum of education; we compel all persons, of all ages and both sexes, to conform to a certain sanitary minimum; we compel all employers to conduct their businesses according to a certain measure of safety and healthfulness; we accord to women, young persons and children the minimum of leisure under the factory acts. These fragments of a standard of life are limited in their utility because we do not insist that every person industrially employed shall be insured a minimum of remuneration. So far, the only provision which we make toward the minimum of subsistence is to provide maintenance in prisons or workhouses for all who care to qualify, and to extend to children some protection from parents who starve them."

The foregoing is, I think, the intellectual basis upon which is built up the plea for a national minimum wage. The same idea runs through a great deal of present or impending legislation. For example, only this week the British House of Commons has recognized the principle

that ill fed or hungry children who attend the public schools shall be fed at the expense of the community. Again, the principle of old age pensions has long since been conceded by the House of Commons, and will become an accomplished fact as soon as some new source of income is taxed—possibly by the taxation of ground values. I put these facts to my informant and he admitted that all this was an indirect way, but, in his opinion, it is becoming necessary to proceed by enactments applying to the whole country, so that there may be no low wage district with a debased advantage over the others.

#### The Practical Difficulties.

So much for the argument. It is not necessary here to point at much length to the practical difficulties. Certain questions will be asked and must be answered, as, for example, shall the minimum wage be based on the cost of maintenance of an adult or of an average family; shall there be the same standard for working women as for men, and if so, will women find employment; is there not a danger of the substitution of young persons for adults; what relation does piece work bear to the minimum wage in piece work trades; how is the minimum wage to be enforced in the admittedly sweated trades; if you adopt the principle of the minimum wage are you prepared to prohibit the importation of foreign-made goods made under admittedly sweated conditions?

There are two other difficulties greater than those implied in the foregoing questions. In the first place, having established your national minimum, on what system are you going to work out the various local equivalents? Wages and the cost of living vary enormously in different parts of the country. And, finally, does not the minimum tend to become the maximum in social arrangements of this description, and is not the labor section poorer in consequence?

#### Wages Boards Would Not Be Used.

In the leading article in *The Iron Age* to which I have referred it is assumed that the minimum wage will be administered by means of wages boards. If Parliament were to indorse the principle, undoubtedly it would not carry the minimum wage into effect by means of wages boards. There is no industry in the kingdom possessing a wages board to which the minimum wage applies. The skilled artisans of Great Britain are almost without exception organized into trade unions, and their wages are a long way above the minimum standards as defined by my informant and quoted here. It is more probable that the wage would be fixed by a Government department.

I have very briefly endeavored to give a synopsis of a conversation I had this week with one of the chief political forces working with all his might to induce the industrial masses to seek immediate alleviation of their lot by making the principle of the minimum wage a political issue. There is one point which may be emphasized as a guide to the future for all industrial students, who must necessarily interest themselves in this question. The well paid artisan will be very loth to do anything to bring it about, because he believes that the minimum tends to become the maximum and that, in consequence, his wages and his standard of life will *pro tanto* be reduced. The minimum wage question in Great Britain may become a trade union question from a sense of social compunction, but certainly not from any economic necessity, for the simple reason that practically every trade unionist in Great Britain is receiving more than would be provided under any minimum wage.

The findings of the Parliamentary Committee on Physical Deterioration are the strongest instrument of the advocates of the minimum wage. I think it will readily be conceded that the physical condition of the workers of Great Britain who live in highly congested industrial centers is one which justifies grave foreboding. On the one hand, the wealthy and lower middle classes are physically improving; on the other, the poverty stricken population is physically in a state of decadence. Facts like this make us ponder on the future of our country, and it is not surprising that here and there intense pessimism finds vivid utterance.

S. G. H.



### The National Association of Manufacturers.

ATLANTA, GA., May 16, 1905.—(By Telegraph.)—The tenth annual convention of the National Association of Manufacturers was convened in this city to-day for a three days' session, lasting through Thursday of this week. Three hundred delegates are in attendance. The opening session was devoted principally to addresses of welcome by Governor Terrell of Georgia, Mayor Woodward of Atlanta and John Temple Graves, welcoming the delegates to Georgia and Atlanta. William McCarroll of New York replied to the welcoming addresses in behalf of the National Association of Manufacturers. In his remarks Mr. Carroll referred to organized labor, declaring that the workingmen should be free and have a right to work wheresoever and however they desired.

The business session of the convention was called to order by President David M. Parry, who delivered his annual address, an abstract of which will be found elsewhere in this issue. At the conclusion of President Parry's address, Ludwig Nissen of New York addressed the convention on "Governmental Relation to Public Franchises." He was followed by D. A. Tompkins of Charlotte, N. C., who spoke on "The Present and Future of Cotton from the Plantation to the Loom." He stated that all cotton farmers would be benefited by an influence that tended to reduce variations in the price and production of cotton, and that great variations injured the farmer as well as the manufacturer.

The feature of the afternoon session was the address of David Davenport of Bridgeport, Conn., on "The Necessity for Organization, National and Local." He declared that it was necessary for manufacturers to organize and maintain the principles of the Declaration of Independence against labor unions. Laws are being violated and liberties disregarded by organized labor. It is the duty of manufacturers, he said, to organize and prepare to fight for their rights. Speaking of railroad rate legislation, he said the proposed legislation as attempted by President Roosevelt meant the rate making powers with a political board. "This proposition," said he, "I denounce as the worst kind of socialism."

The report of the Committee on Interstate Commerce was read by E. B. Pike of New Hampshire, the chairman. The report declared that it is to the interest of the railroads themselves to have reasonable legislation enacted. Otherwise, the report continued, irresistible public opinion might force radical and revolutionary action. It was the committee's belief that a commission should be appointed to hear any complaint that might be made in case of injustice, but that the rate making power should remain with the railroads. The rates put in after the hearing of a complaint should be only temporary.

The following committees have been appointed:

Nominations: Antony Ittner, Missouri; E. S. Harts-horn, New Jersey; L. M. Byles, Illinois; W. E. Talmage, Michigan; Geo. R. Seabrook, Iowa; E. T. Skinner, Michigan; John W. Nesmith, Colorado; T. J. Stevenson, Tennessee; W. J. Blakeney, Ohio; W. J. Golden, Pennsylvania; T. B. Gordon, Georgia; P. C. Grooks, Wisconsin; E. H. Dean, Indiana; E. B. Wright, North Carolina; O. S. Foster, New York; A. V. Dee, Pennsylvania; D. C. Ripley, Pennsylvania; Wm. Snyder, Ohio; J. H. Bruce, Tennessee.

Rules and Order: Wm. McCarroll, New York; H. S. Smith, Wisconsin; E. B. Pike, New Hampshire; A. B. Farquhar, Pennsylvania; Thos. M. Sechler, Illinois; Jas. Ingless, Michigan.

Credentials: D. A. Tompkins, North Carolina; C. W. Post, Michigan; A. E. Cheney, Ohio; C. C. Hanch, Indiana; A. B. See, New York; E. P. Browning, Kentucky; Nathan Mayer, Maryland.

Resolutions: Ludwig Nissen, New York; Geo. O. Draper, Massachusetts; H. C. Gardner, Illinois; John Kirby, Jr., Ohio; S. Gunby, Georgia; J. W. Van Cleave, Missouri; Thomas P. Eagan, Ohio; W. C. Nunnemacher, Kentucky; R. C. Jenkinson, New Jersey; William Butterworth, Maryland; H. S. Chamberlain, Tennessee; A. C. Rosencranz, Maryland; Wm. S. Townsend, Maryland; A. N. Bullard, Connecticut.

The programme for the following sessions of the convention includes many papers of special and vital interest to the manufacturers. Secretary Metcalfe of the United States Department of Commerce and Labor will deliver an address before the convention, which is looked forward to with interest and many other prominent speakers will take part in the proceedings. New York and San Francisco are making a hard fight for the next convention. A reception was tendered the visiting members of the association at the Capital City Club on Tuesday evening, and several enjoyable events have been prepared for the delegates' entertainment.

### Panama Canal Will Buy Abroad.

WASHINGTON, D. C., May 16, 1905.—The Isthmian Canal Commission has decided to depart from the time honored custom of buying in the United States all material for public works, and will hereafter purchase in the cheapest markets, whether at home or abroad. This decision will probably not apply to small purchases or to goods which can be more quickly secured in this country than abroad, but wherever a substantial saving can be effected by going outside the United States the commission will put economy before every other consideration. The new policy will apply especially to the purchase of vessels, several of which are needed, at least two being required to transport materials, food supplies, &c., from United States ports to the isthmus. The commission's decision has been approved by the Secretary of War and presumably has the indorsement of the President.

The members of the commission were reluctant to adopt this new policy not only because of their natural desire to place all their orders with American manufacturers, but because they realized that it would be made the basis of attacks upon the protective policy, a consideration that appealed especially to Secretary Taft as a member of the Administration and one of the most trusted advisers of the President. It is said, however, that when it became apparent that in certain cases foreign materials could be laid down on the isthmus for 25 to 40 per cent. less than American goods of equal quality, and that in the case of two 6000-ton vessels which the commission desires to buy the cost in the United States would be at least \$1,400,000, as compared with \$750,000 in Europe, it was decided that the commission would not be justified in paying larger prices for the sake of placing the orders at home. A further consideration in the case of the two vessels referred to was the fact that they could be purchased in Europe already built, while it would require at least 18 months to have them constructed in the United States.

It is expected by the commission that a movement will be set on foot by American manufacturers for the purpose of securing legislation from Congress requiring all materials and supplies for the canal to be purchased in the United States. Such legislation, however, cannot be obtained in time to prevent large purchases and the making of contracts for future delivery, and some doubt is expressed as to whether Congress will be disposed to interfere. Secretary Taft points to the fact that attention was drawn to this subject in the first report of the Isthmian Canal Commission, which afforded Congress an opportunity to enact any restrictions within its wisdom. The Canal Commission holds, and the secretary agrees with it, that failure to legislate on the subject leaves the commission free to buy abroad whenever it is in the interest of the American taxpayer to do so. Another consideration that has moved the commission is the fact that Congress at the last session failed to enact the pending bill restricting the transportation of materials for the canal to American ships. This bill was a part of the programme formulated in the interest of the American merchant marine, but it was opposed by Admiral Walker, president of the old commission, who always advocated the construction of the canal at the lowest possible cost without regard to the source of materials employed.

It goes without saying that the decision of the commission has created a decided stir and those public men who favor a revision of the tariff assert that the decision of the commission will prove a powerful argument in favor of overhauling the schedules of the Dingley act when the Fifty-ninth Congress meets.

W. L. C.

## OBITUARY.

VICTOR LEE CRABBE, purchasing agent of the Carbon Steel Company, Pittsburgh, was one of the victims of the terrible accident on the Pennsylvania Railroad at Harrisburg, Pa., on Thursday morning, May 11. He was a son-in-law of Robert Pitcairn, resident assistant to President Cassatt of the Pennsylvania Railroad Company. Mr. Crabbe was born in Wooster, Ohio. When about 20 years old he graduated from the Wooster University with high honors. He then went to Pittsburgh and taught in Shady Side Academy for a short time. About 15 years ago he entered the employ of the Carbon Steel Company in the sales department and was steadily advanced. He was returning from New York City from attending a hearing in court in which the Carbon Steel Company was interested. He was a member of the Duquesne and University clubs in Pittsburgh. He is survived by his widow and two children.

JAMES R. PHILLIPS of Pittsburgh was another victim of the Pennsylvania Railroad wreck at Harrisburg. Mr. Phillips was engaged for some years in the tin plate business at Ellwood City, Pa., until his plant was absorbed by the American Sheet & Tin Plate Company. For several years he was district manager in Pittsburgh of this company. About a month ago Mr. Phillips, with some associates, bought the plant of the Clarksburg Tin Plate Company, at Clarksburg, W. Va., and at the time of his death was busy with plans for the removal of the plant to the Pittsburgh district and its enlargement. He was a member of the Duquesne, Union and Pittsburgh Golf clubs, all of Pittsburgh.

SAMUEL P. HARBISON, chairman of the Harbison-Walker Refractories Company, Pittsburgh, died of pneumonia at his home in Allegheny, Pa., May 10, after an illness of only a few days. He was born in Bakerstown, Pa., in 1840. At 16 years of age he had prepared himself to qualify as a teacher in the public schools. After serving several years in the country schools he went to Pittsburgh and engaged as a teacher in the Minersville school. In 1864 he obtained employment at night as a book-keeper with the Star Fire Brick Works, which, after eight years, he entered as a partner, the concern being known as Reid & Harbison. A year later the firm was merged into the Harbison-Walker Company, and since that time Mr. Harbison has been active in its management. For some time prior to his death he had been chairman of the board. Mr. Harbison was connected with many Pittsburgh business interests. He was identified with a number of banking institutions and was a director of the Pennsylvania National Bank and a member of the board of the Allegheny General Hospital. He was equally prominent as a supporter of Grove City College and was a member of its board. He was also actively connected with the work of the International Young Men's Christian Association.

JOB M. LEONARD, the last of a famous New England family of iron workers, died at Fall River, May 7, aged 81 years. He was a direct descendant of the Leonard family of iron workers who came to Raynham, Mass., from Wales in 1652, and, including his son, Henry B. Leonard, who died recently, was one of five generations of iron manufacturers who were in business in the southeastern part of Massachusetts for more than two centuries. In 1844 Mr. Leonard went into the hardware business, and established a Boston office in 1849, which was maintained until about a year ago. In 1850 he established the East Bridgewater Iron Company, and five years later sold out his interest and organized the Mount Hope Iron Company at Somerset, Mass., and built two plants for the manufacture of nails and plate. The present works, which are being dismantled, were erected in 1872. The business was continued until the death of Henry B. Leonard, when the father decided to retire, and the plant was closed. Mr. Leonard served three terms in the Massachusetts House of Representatives, and had also been a State Senator. He leaves one daughter.

HENRY W. MILLAR of Utica, N. Y., president of the Charles Millar & Son Company, sales agent for the Utica

Pipe Foundry Company, died suddenly of heart failure May 10 while in Chicago for medical treatment. Mr. Millar was 80 years of age.

WILLIAM PLANKINTON, a leading citizen of Milwaukee, died suddenly April 29, aged 61 years. He was the owner of the Plankinton House, and had also for years been actively identified with a number of Milwaukee manufacturing institutions. He was at one time president of the Johnson Service Company and was long one of its directors. At the time of his death he was a director of the Fuller-Warren Stove Company and of the Milwaukee Cement Company.

## PERSONAL.

Jordan L. Mott, Jr., is participating in the ocean yacht race on board the Utowana.

The Pullman Company, Chicago, announces the following appointments, effective May 5: E. R. Slagle, manager sales department; Thomas Dunbar, manager Pullman Car Works, vice E. R. Slagle; Robert Tinsley, superintendent Pullman Car Works, vice Thomas Dunbar.

Claude A. Tupper has been placed in charge of the electrical publications of the Allis-Chalmers Company, Milwaukee, under the direction of Arthur Warren, manager of the department of publicity.

G. L. Luetcher, metallurgical engineer, has changed his address from Pittsburgh, Pa., to Beaverton, Ore.

Last week a party of officials of the National Tube Company inspected the company's new works at Lorain, Ohio, and other plants. In the party were W. B. Schiller, president; Edward Worcester, first vice-president; J. D. Culbertson, second vice-president; Taylor Alderdice, third vice-president; E. Latshaw, manager of the Pennsylvania Works, and J. F. Townsend, traffic manager.

J. Louis Vallett of the Chester Works of the National Tube Company has been appointed superintendent of the company's Youngstown works, to succeed Henry W. Hoch, recently resigned.

Albert G. Kerr, secretary of the Beech Creek Coal & Coke Company and treasurer of the North River Coal & Wharf Company, has been elected a director of the Coal & Iron National Bank, Liberty and West streets, New York.

George J. Chandler, who was for many years connected with the Cleveland Steel Casting Company as secretary and assistant treasurer, has become associated with the Sterling Steel Foundry Company, Pittsburgh, Pa., as general sales manager.

At the annual meeting of the Iron and Steel Institute, held in Sheffield May 11, a Carnegie Research Scholarship of \$500 was awarded to Henry Cook Boynton, instructor in metallurgy and metallography in Harvard University. Mr. Boynton is the third American to be successful in obtaining this highly prized scholarship, two Columbia University men having previously won it. Mr. Boynton has devoted much time to research work dealing chiefly with the metallography of iron and steel, and has written several papers on the subject. The present scholarship will make possible a more vigorous prosecution of his investigation in the metallurgical laboratory of Harvard University.

William Carroll, for many years Superintendent of Construction in the Chicago Fire Department, has been appointed City Electrician, to succeed E. B. Ellicott, who has been made Chief Hydraulic and Electric Engineer of the sanitary district.

At a meeting of the Board of Directors of the American Car & Foundry Company, held at Detroit, Mich., May 9, William C. Dickerman was elected third vice-president, to take office immediately. Mr. Dickerman has served for a number of years in the capacity of general sales agent, and, as heretofore, his headquarters will be in New York.

E. M. S. Young, formerly vice-president of the Superior Steel Company, Carnegie, Pa., has resigned to become manager of sales for the Allegheny Steel & Iron Company and the Interstate Steel Company, makers of fine



sheets, with offices in the Farmers' Bank Building, Pittsburgh, and works at Avenue and Breckenridge, Pa.

F. E. Reed of the F. E. Reed Company, Worcester, Mass., and president of the Worcester Metal Trades Association, returned last Thursday from California, where he has been on an extended trip for his health. He returns much improved.

Julian Kennedy, Bessemer Building, Pittsburgh, has been appointed consulting engineer for the new Bessemer steel plant to be built by the Youngstown Sheet & Tube Company, Youngstown, Ohio.

Col. Harry P. Bope, vice-president of the Carnegie Steel Company, was severely injured in the Pennsylvania Railroad wreck at Harrisburg, Pa., last week. He was taken care of at the house of a friend in Harrisburg for some days, until he was able to go to his home in Pittsburgh.

At a meeting of the directors of the Tennessee Coal, Iron & Railroad Company, held May 16, Don H. Bacon was re-elected president and chairman of the Board of Directors, Frank S. Witherbee was chosen first vice-president and L. Hoover secretary and treasurer. In order to install L. T. Beecher as second vice-president, H. R. Sloat resigned from the board and Mr. Beecher was elected to fill the vacancy. Mr. Beecher, who was formerly secretary and treasurer, was thereupon elected second vice-president and Mr. Sloat assistant secretary and treasurer.

### Labor Notes.

Approval of the report of the wage committee of the Amalgamated Association, providing for increases in present scale wages ranging from 7 to 20 per cent., was made by the delegates in session at Detroit, Mich., May 15. It is said the new wage scale will be presented to Eastern bar iron mills and a strong effort made to enforce it. Under the terms of the new scale, the puddling rate is \$5 a ton on a 1-cent card instead of \$4.90, as in the present scale. In the sheet and tin plate scales material advances in wages have been asked and important changes made in the footnotes. The advance in the sheet scale is said to average about 18 per cent. A clause has been embodied in the sheet scale that the company pay for cleaning the furnaces and grates at the end of each week. In the present scale the men paid for this work. In the tin plate scale the present base is \$3.40 per box and it is necessary for tin plate to advance 10 cents a box before wages can be advanced. In the new scale an advance of 5 cents a box in tin plate entitles the men to a 2 per cent. advance in wages. There is every probability that the bar iron, sheet and tin plate mills will vigorously contest the terms of the new scales, claiming that the wages proposed are entirely too high. It is understood also that the limit of output in the union sheet and tin plate mills has been maintained and this will also be a cause of contention when the conference committees of the manufacturers and the Amalgamated Association come together. The sheet and tin plate mills that sign the scale will insist that the limit of output be removed, claiming they cannot compete in the market with nonunion mills where no limit of output exists. As yet no date has been set for conference on any of the scales between the manufacturers and the Amalgamated Association.

Charles Casey, secretary; George Miller, business agent, and Henry Newman, president, of Carriage Makers' Union No. 4, were arrested in Chicago on May 13 for complicity in the murder of Charles Carlston on April 13. Their apprehension was followed the next day by the arrest of Frank Novak and John Heiden, connected with the same union, as accessories before the fact. The five arrests followed the confession of Casey that he and his fellow unionists hired sluggers to beat nonunionists for \$15 each. Casey's confession, which is one of the most startling documents of the kind ever made, gives details of the Executive Committee meeting which voted \$50 for "educational" purposes.

The bimonthly settlement of the puddling and bar iron scales was made at Detroit, Mich., last week. It was found that the average price of shipments of iron bars for March and April slightly exceeded 1.50 cents at mill, entitling the puddlers to an advance of 25 cents a ton and finishers 2 per cent. The puddling rates for May and June will be \$5.37½ per ton.

About 20 boiler makers in the employment of Logan Iron Works, engaged in the erection of a gas holder at Hempstead, Long Island, struck, May 8, at the suggestion of the business agents of the boiler makers' and boiler makers' helpers, although they were perfectly satisfied with the conditions under which they were working. A few days afterward the men made personal application to the company for jobs and they were permitted to return to work. Two of the boiler makers who refused to strike at the demand of the walking delegate were assaulted by him and some companions.

### The National Association of Stove Manufacturers.

—The thirty-fourth annual convention of the National Association of Stove Manufacturers was held in Chicago May 10 and 11, under the presidency of Peter B. Acker, New York. The reports of the officers showed the association to be in a flourishing condition. Four new firms were admitted to membership. George H. Barbour, Detroit, read a paper on "Modern System of Accounting"; Edmond Raftery, Aurora, Ill., one on "Foundry Costs"; John R. McKnight, Elkins Park, Pa., on "Stove Repair Piracy"; John D. Green, Albany, N. Y., "The New Trademark Law"; George Mitchell, Pittston, Pa., "Local Associations"; Wm. J. Myers, New York, "The Future of the Pig Iron Market"; John Magee, Boston, "Labor Saving Devices," and Abram C. Mott, Philadelphia, "Cash Discounts." A resolution was passed in the discussion recommending to local associations that they adopt the 2 per cent. cash discount plan. The following officers were elected for the ensuing year: President, Walter P. Warren, Troy, N. Y.; vice-presidents, W. G. Henry, Chicago; W. J. Myers, New York; treasurer, R. L. Morley, Chicago; general secretary, Thomas J. Hogan, Chicago; Board of Managers: George D. Dana, St. Louis; E. W. Anthony, Boston; C. A. Du Charne, Detroit; Edward Bowditch, Albany; N. H. Burt, Leavenworth. New York City was selected as the place of next meeting, the date being the second Tuesday in May, as governed by the constitution of the association.

### The New York and New Jersey Foundrymen's Association.

—A well attended meeting of foundrymen was held Wednesday evening, May 10, and as a result a permanent organization was completed, known as the New York and New Jersey Foundrymen's Association. The following officers were elected: J. F. Arnold of Sneed & Co. Iron Works, president; Lawrence Fagan of Fagan Iron Works, vice-president; Francis D. Jackson of Hecla Iron Works, treasurer; Henry C. Hunter, secretary. The Executive Committee consists of the officers, John J. Riley and John Ferguson of F. Ferguson & Son. The present membership consists of a large majority of the principal foundries in and about New York City, and practically all the foundries in that district have expressed their approval of the association and their intention to join it. The association will occupy offices with the New York Metal Trades Association. The first subject to engage the attention of the new association is the demand of the International Brotherhood of Foundry Employees for an increase in wages, the employment of only such persons as are members of the Brotherhood or such as will sign an application for membership in the Brotherhood, the discharge of expelled or suspended members of the Brotherhood and the privilege of the walking delegate to visit the shops to transact union business. The association has already taken action on these demands and a meeting will be held within a few days to take further action on them.

## NEWS OF THE WORKS.

## Iron and Steel.

The plant of the South Pittsburgh Iron Works, at Claysville, Pa., which has been in the hands of receivers for some months, was offered at public sale May 6, but was not sold, \$25,000 being the highest bid. A. W. Krause, receiver, postponed the sale until Friday, May 19. The indebtedness of the company is given as \$80,000, and some time ago a proposition was made to the creditors to pay their claims in cash on the basis of 50 cents on the dollar. About 90 per cent. of the creditors signed this agreement, but the balance refused and it is not known whether this plan can be carried out.

The American Tube & Stamping Company, Bridgeport, Conn., is installing at its East Side open hearth department and billet mill, besides a sheet mill, a continuous mill for rolling its billets into bands, merchant and sheet bars and small billets, in addition to a similar department that is now located at one of the company's two works at the West End. The additions will afford the advantage of rolling many of the billets when they are still hot from the billet mill, and doing all the work on the premises will effect considerable saving in transportation and extra handling. The space now devoted to the hot rolling of finished products will be used partly for additional cold rolling and partly for other purposes. All additional machinery and appliances that will be required have already been purchased or contracted for, and it is expected that the additions will be finished and in full operation by early fall.

The Meurer Brothers Company, Brooklyn, N. Y., manufacturer of tin plates and dealer in sheet iron and metals, has purchased 14 lots fronting on the north side of Borden avenue and extending through to the south side of Third street, Long Island City, upon which it contemplates the erection of a plant for the manufacture of iron and steel plates. No definite plans have as yet been prepared and no details are available.

The Blondell Steel Company, Cambridge, Ohio, has incorporated, with a capital stock of \$1,000,000, for the manufacture of Bessemer angles, bars, flats, rounds and special shapes. A. L. Schultz is president, H. E. Scarborough vice-president, C. B. Fish secretary and W. A. Crawford treasurer. These gentlemen, with Peter Blondell of Cambridge, Ohio; L. T. Yoder, Chas. Relf, J. N. Lear, J. A. Langton of Allegheny, Pa.; R. E. Erdman and J. E. Allard of Buffalo, N. Y., constitute the Board of Directors.

The Girard plant of the Carnegie Steel Company, at Girard, Ohio, has been practically dismantled, the best part of the equipment having been removed to the mills at Greenville, Pa.

At a meeting of the stockholders of the Crane Iron Works, recently held at Catasauqua, Pa., the following directors were elected. Leonard Peckitt, James W. Fuller, Mark T. Cox, E. R. Chapman, C. H. Zehnder, A. A. Fowler and James S. Stillman.

Chas. P. Walter and Thomas Hardie, receivers of the Philadelphia Steel & Iron Company, Philadelphia, Pa., have been authorized to sell the property on May 27. No bids will be entertained for less than \$87,500. The assets of the company are \$71,745 and the liabilities, \$122,070.

The new 12-inch pipe mill of the Youngstown Sheet & Tube Company, at Youngstown, Ohio, is about ready to start and will be put in operation as soon as some threading machines have been installed.

No. 3 Ohio furnace of the Carnegie Steel Company, at Youngstown, Ohio, has been blown out for repairs and will be idle about a month.

## General Machinery.

Spang, Chalfant & Co., Incorporated, Pittsburgh, will build large additions to their pipe and tube mills in that city, as noted in these columns last week, and have placed a number of contracts for the equipment. The Fischer Foundry & Machine Company, Pittsburgh, will furnish butt weld machinery; Northern Engineering Works, Detroit, Mich., three 5-ton cranes; Forter-Miller Engineering Company, five gas producers; Acme Machinery Company, Cleveland, Ohio, bolt cutters and other machinery, while the Buckeye Engine Company, Salem, Ohio, will furnish a 500 horse-power Buckeye engine.

The Weatherford Machine & Foundry Company, Weatherford, Texas, has increased its capital stock from \$10,000 to \$20,000 and is to enlarge its capacity.

The Sipp Electric & Machine Company, Paterson, N. J., has let contracts for the erection of a one-story office and shop building, which will be of modern construction and equipped with sprinkler system and other up to date appliances. The shop will be operated and lighted by electricity. All contracts have been taken care of.

The Falk Company, Chicago, Ill., has not yet completed the specifications for the mechanical equipment for its new buildings. It is expected that the company will not need much additional machinery, as the extensions are to be used principally for the chipping and cleaning department. An order has been placed with Pawling & Harnischfeger, Milwaukee, for another 30-ton electric traveling crane with 80 feet span. The company is building a lot of power saws in its own shop.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad, Minneapolis, Minn., is building a six-pit addition to its machine shop, 120 x 130 feet inside dimensions, with a 30-foot gallery on the machine side. All machinery for this addition has been ordered, including several motor driven tools. The company will also build an additional toolroom, 30 x 40 feet, the tools in which will be driven in groups by electric motors.

Frank P. Hakes of Cortland, N. Y., has been appointed receiver for the American Road Roller Company, Groton, N. Y., on the application of creditors.

New locomotive shops of the Lehigh Valley Railroad at Sayre, Pa., will, it is said, be put in operation about June 15.

The Bishop Mfg. & Construction Company has been organized with a capital stock of \$2,500,000, under a charter granted by the State of Washington, to manufacture a new steam derrick excavator, the patents for which were secured by Cicerio Bishop of Denver, Col. The company is in the market for gasoline or crude oil engines of from 15 to 20 horse-power, besides other machinery. The offices of the concern are at 403-404 Hyde Block, Riverside avenue, Spokane, Wash., and Cicerio Bishop, the president, has charge of the purchasing. The other officers are, Henry L. Lillenthal, vice-president; Mrs. B. H. Bishop, treasurer; Edwin W. Hand, secretary. The trustees are Mr. Bishop, Mr. Hand and Mr. Lillenthal.

The St. Louis and San Francisco Railroad Company is contemplating an addition to its Memphis, Tenn., shops. The extension will be of wood and brick construction and will aggregate in the neighborhood of 1500 square feet area. The company has not arranged for new machinery as yet, although some will be purchased. Considerable of the machinery now on hand will be installed in the new structures.

The business of Harvey Hubbell, Bridgeport, Conn., manufacturer of machinery and tools, brass and iron machine screws and electrical specialties, has been incorporated under Connecticut laws with a capital stock of \$100,000. The name of the corporation does not change the style, being Harvey Hubbell. The incorporators are Harvey Hubbell, Louis Hubbell and Francis E. Laimbeer. Mr. Hubbell's purpose in incorporating is to perpetuate the business, which was established in 1888. The management and personnel will remain as in the past.

The Record Foundry & Machine Company, Livermore Falls, Maine, expects to extend its shop 48 feet.

The Bauer Machine Company with headquarters in Jeffersonville, Ind., has incorporated to manufacture special machines, principally for stitching harness. The company is now equipping a plant at Louisville, Ky.

## Power Plant Equipment.

The city of Chisholm, Minn., let a contract May 2 to the Crowley Electric Company, Duluth, Minn., for one 125 horse-power Scotch marine boiler, one Worthington underwriters' fire pump and one 80-foot smokestack, 30 inches in diameter.

The Elkhart Water Company, Elkhart, Ind., contemplates installing a new pump of 6,000,000 or 8,000,000 gallons capacity.

The city of De Pere, Wis., received bids May 4 on certain improvements to the water works plant and awarded contracts as follows: 13,870 feet of 6, 8, 10 and 12 inch castings and 22,000 pounds of special castings to the United States Cast Iron Pipe & Foundry Company; 34 fire hydrants and 29 6, 8, 10 and 12 inch gate valves, the Ludlow Valve Mfg. Company; laying the pipe, setting hydrants, &c., Walter O. Bahr, Manitowoc, Wis.; two 50,000-gallon elevated steel tanks and towers, Chicago Bridge & Iron Company; one 50 horse-power suction gas producer and gas engine, the Otto Gas Engine Company; one 500-gallon triplex power pump, the Deane Steam Pump Company; two 50,000-gallon concrete reservoirs, Miner & Larsen, Richland Center, Wis.; 200 or more meters,  $\frac{3}{4}$  to 1 inch, the National Meter Company.

The Steuterman National Invention & Mfg. Company, St. Louis, Mo., will utilize its new plant at Belleville, Ill., for the manufacture of gasoline engines for the propelling of locomotives, street cars and other vehicles, and will also make other machinery and tools in this plant. Employment will be given to a large force of men. The company owns a 10-acre property within the limits of the city, on which it is now erecting its buildings.

The Grimm Boiler Company, Quincy, Ill., is to move its plant to Shreveport, La., the Board of Trade of the latter city having agreed to give the company a bonus.

The Phillips Company, 88 Broad street, Boston, Mass., has been incorporated to take over the business formerly carried on by Walter J. Staples under the same name, manufacturing engine and boiler attachments. The capital stock is \$20,000. The officers are: President, W. J. Staples; treasurer, Charles W. Hodgdon; directors, these officers and William W. Rich.

The Western Counties Transmission Company has been incorporated at Buffalo, N. Y., capitalized at \$2,000,000, to manufacture, transmit and sell electricity in the counties of Western New York. The directors are Robert W. Pomeroy, Joseph Dudley, Harry T. Ramsdell, Harold G. Meadows, Charles L. Gurney, Robert W. Chapin and Louis B. Hart of Buffalo. This incor



poration takes effect before the bill creating a State Commission to have control of electrical transmission and gas companies becomes a law.

The Department of Water of Oswego, N. Y., will receive bids until May 18 for two 2,500,000-gallon centrifugal pumps, two 250 horse-power water wheels, generators, motors, transformers and other equipment.

Erwin & Company, 56 and 58 Dearborn street, Chicago, Ill., have taken the agency of the Standard pumping engine, which is designed expressly for domestic water supply.

Among the orders recently placed with the Allis-Chalmers Company, Milwaukee, Wis., are the following: Harbinson & Walker Refractories Company, Pittsburg, Pa., for its plant at Hays, Pa., one heavy duty horizontal Reynolds Corliss belted engine, with cylinder 22 inches in diameter and a 42-inch stroke; the City of Hastings, Neb., an equipment of electric lighting plant, to consist of a heavy duty cross compound Reynolds Corliss engine, with cylinders 14 and 22 inches in diameter and a 36-inch stroke, direct connected to a 222-kw. single phase Bullock alternator, together with auxiliary apparatus; the Republic Iron & Steel Company, Youngstown, Ohio, one horizontal cross compound condensing Bessemer blowing engine capable of delivering 24,000 cubic feet of free air per minute at a pressure of 28 pounds per square inch.

#### Foundries.

F. E. Meyers & Bros., Ashland, Ohio, manufacturers of hardware specialties, are preparing to erect an addition to their plant in the form of a large foundry.

The plant of the Summit City Machine Company, Akron, Ohio, has been sold by Receiver Charles O. Kerstetter to Frank Wybel of that city, who will operate the business under the name of the Globe Foundry. George Wybel has been appointed manager of the business and will turn out foundry work of every description, making a specialty of clay mill work. There will be no machine shop in connection with the plant.

The style of the Newby Stove Repair Company, Kansas City, Mo., has been changed to the Hoover Stove & Casting Company. A. S. Newby severed his connection with the company some five years ago. The warehouse of this company is at 2004 Baltimore avenue. A foundry is now being built at Seventeenth and Oakland streets, comprising two buildings, each 60 x 100 feet. The company will make some inexpensive heaters, but its principal product will be stove castings or repairs for cooks, ranges and heaters. J. K. Hoover is president and H. E. Hoover secretary and treasurer.

The Anniston Foundry & Machine Company, Anniston, Ala., has let contracts for the erection of an addition to its plant 85 x 100 feet, which will be used for the manufacture of water and gas service boxes, soil pipe and fittings. At present the company is engaged in boiler making and locomotive repairing and the manufacture of iron and brass castings. No new machinery is required.

The American Steel Foundries is enlarging its various plants to take care of its increased business. The company has lately received an order for cast steel body and truck bolsters for 2000 Detroit Southern Railroad Company's cars. These cars will be built in the shops of the American Car & Foundry Company and will consist of 1800 40-ton gondolas and 200 30-ton flat cars.

Plans for the new plant of the Detroit Steel Casting Company, Detroit, Mich., have been prepared by the Garrett-Cromwell Engineering Company, Cleveland, Ohio. The plans call for a brick, fire proof constructed building, 165 x 400 feet, to cost \$175,000. Contracts for power and machinery equipment have already been let.

The business of the Pilgrim Foundry Company, Kingston, Mass., manufacturer of ranges and stoves, has been incorporated under Massachusetts laws with a capital stock of \$40,000. The officers are: President, Eugene E. Shaw, Carver, Mass.; treasurer and clerk, Elmer F. Shaw, Carver; directors, these officers and Fred E. Gould, Plymouth, Mass.

#### Bridges and Buildings.

The Elkhart Bridge & Iron Company, Elkhart, Ind., has been awarded contract for a 231-foot bridge to be built across the St. Joseph River at Conantime, Mich. The contract amounts to \$13,377.

Plans and specifications are now being prepared and bids will be received about June 1 by L. W. Loehr, Walla Walla, Wash., for one 100-foot and one 70-foot bridge to be built across the Touchet River.

Contracts have been placed with Wm. B. Scaife & Sons Company, Pittsburgh, Pa., for a steel frame trestle to be erected at Bellefonte, Pa., for the American Lime & Stone Company; also for a steel frame tippie about 400 feet long for its Buffalo Run plant.

The Columbus Structural Steel Company, Columbus, Ohio, has completed plans for its new plant, which will consist of a main building 100 feet square. The machine equipment is entirely in the hands of the general manager, L. G. White, whose address is care of the Columbus Railway & Lighting Company, Columbus, Ohio.

The Champion Iron Company, Kenton, Ohio, has been awarded, at \$33,000, the contract for the steel to be used in construct-

ing the new cell house at the Anamosa (Iowa) Penitentiary. The steel will be furnished ready to be put together and riveted by the convicts.

The Builders' Iron & Steel Company, Pittsburgh, has been incorporated with a capital of \$5000. The new concern can be addressed care John A. Butz, Park Building, Pittsburgh.

#### Fires.

The Coburn Mill, Skowhegan, Maine, operated by the American Woolen Company, was recently damaged by fire to the extent of \$10,000.

The fiber leather factory at Lyndon, Vt., owned by George F. Cushman, St. Johnsbury, Vt., and Walter Rankin, Boston, was burned May 12, with a loss of \$20,000.

The agricultural implement factory of P. K. Dedrick's Sons, on the outskirts of Albany, N. Y., was partly destroyed by fire last week. The loss is about \$20,000.

Dillon's flouring mill, near Troy, Pa., and several adjacent structures were recently destroyed by fire. The loss is said to aggregate \$30,000.

Part of the plant of the D. R. Armstrong Varnish Company, Chicago, Ill., was destroyed by fire May 16.

#### Hardware.

The Louisville Tin & Stove Company, Louisville, Ky., contemplates the erection of a five-story factory and warehouse, 100 x 200 feet, in connection with its present plant.

The Banana Steel Crate Company has incorporated at Detroit, Mich., with a capital stock of \$10,000. The stockholders are Theodore H. Ruddiman, Miron W. Kimball, Florence Kimball and Guy Kimball. Offices of the company are at 58-60 First street, Detroit. The company will manufacture a steel crate for the shipment of bananas. These crates are made in five sizes, ranging from 15 inches in diameter and 30 inches high to 17 inches in diameter and 42 inches high.

George L. Fordyce of Youngstown, Ohio, with some associates, will probably purchase the plant of the Penn Shovel Company, at Warren, Ohio.

The Randolph-Clowes Company, Waterbury, Conn., brass manufacturer, is adding a new casting shop, 30 x 122 feet.

The Marston rake factory, Littleton, N. H., has been acquired by a new firm known as Flanders & Everest, who will continue the manufacture of the same line of goods as their predecessors.

#### Miscellaneous.

The Struthers Coal & Coke Company, an identified interest of the Struthers Furnace Company, at Struthers, Ohio, has placed a contract for the building of 100 beehive coke ovens in New Salem, Fayette County, Pa., in the Connellsville region.

H. H. Wood & Co., Lakeport, N. H., manufacturers of hosiery, are to erect a new mill, 54 x 117 feet and three stores, to replace the building recently destroyed by fire.

The Gorham Mfg. Company, Providence, R. I., silversmith, has acquired the business of the William B. Durgin Company, Concord, N. H., manufacturer of silver ware. The change in ownership will in no way interfere with the operation of the Concord factory.

The St. Louis Car Company, St. Louis, Mo., contemplates the establishment of a car building plant in Buenos Ayres, Argentine Republic, where the company's products are well known.

The Ohio Leather Company, Girard, Ohio, is preparing to erect an addition to its main shop, 50 x 115 feet and four stories high; beam house, 115 x 186 feet; hide cellar, 60 x 200 feet, and an addition to the power and engine house, 55 feet. Additional power equipment will be installed.

The Lock Joint Pipe Company, 346 Broadway, New York, has incorporated to do a general contracting and manufacturing business. The company will place on the market a pipe made out of cement and reinforced with steel. Coleman Meriwether is president and general manager, Allan M. Hirsch secretary and treasurer and Phillip Aylett chief engineer.

The Ashuelot Paper Company, Hinsdale, N. H., expects to rebuild the part of its plant which was recently destroyed by fire. With the exception of one 500-gallon pump the power plant was uninjured.

The Bowers Mfg. Company, Lima, Ohio, has merged with the Indianapolis Steel Roofing & Corrugating Company, Indianapolis, Ind., and will consolidate its plant with that of the latter company in Indianapolis. The Indianapolis Steel Roofing & Corrugating Company has increased its capital stock from \$15,000 to \$75,000, and will occupy a new building, 68 x 195 feet, two stories high, at 229-233 East South street. This new building will be used for offices, salesroom and warehouse, and a full line of tinners' supplies in addition to the present line will be carried. The present plant at 23 and 25 East South street will be used for the manufacture of art ceilings and interior decoration, sheet metal statuary, cornice, &c. The officers are: S. D. Noel, president; F. M. Bowers, vice-president; J. Q. A. McClurg, secretary and treasurer.

The Binns-Fourdrinier Cylinder Company, New London, Conn., has been incorporated in Connecticut with A. S. Winchester as president, Robert Binns as vice-president and E. C. Winchester as secretary. The company will manufacture a patent device for use in paper manufacturing, and has not yet

decided whether it will establish shops of its own or license paper manufacturers to use the invention.

The Hampton Company, textile manufacturer, Easthampton, Mass., is to erect a four-story mill, 50 x 125 feet, and another story will be added to the stockhouse, which is 40 x 110 feet.

The increased activity in the zinc mining industries in the southwestern part of Wisconsin is leading to the organization of new companies with a view to much more thorough development. There was organized in Milwaukee last week the Standard Lead & Zinc Smelting & Mining Company. The organization starts out under favorable auspices. J. D. Zeen, who has interests both in Duluth and Milwaukee, was elected president, and Howard Van Wyck, a former city attorney, was chosen vice-president. Another Milwaukee citizen, E. M. Evans, was made a member of the Board of Directors and will probably be the secretary. R. A. McKenney, a representative of the American Tin Plate Company, has become a large stockholder in the new company.

The Lovell Mfg. Company, New Haven, Conn., has established a factory for the manufacture of wire chains. The company has been incorporated under Connecticut laws, with an authorized capital stock of \$250,000. The company will want no new equipment at present. Special machinery for manufacturing the chain will be built. The officers are: President, Pierpont B. Foster; secretary, A. K. Lovell; treasurer, Herman Laufer.

F. G. Smith, Leominster, Mass., manufacturer of pianos and piano cases, is to build a large addition to his plant in that town, the new building to be 50 x 150 feet and three or four stories. The plan is to manufacture the entire Webster piano at Leominster, which means the removal of the business from Brooklyn. The cases of this piano are now manufactured at Leominster and the action at Brooklyn.

The H. B. Olmstead Company, manufacturer of plumbers' wood work, now located at Brooklyn, is fitting up a wood working plant at New Britain, Conn., and will hereafter do all of its manufacturing in that city. The company has been located at Brooklyn for four years. The president and general manager of the company is Herbert B. Olmstead; vice-president, Enoch Harris, and secretary and treasurer, Hugh A. Pendlebury.

The Roxbury Carpet Company, Boston, Mass., is to build a four-story brick and stone mill, 60 x 86 feet. In addition two stories are being added to the company's storehouse.

The B. D. Rising Paper Company, Housatonic, Mass., is to build an addition to its finishing department, 50 x 75 feet, two stories and basement.

## Trade Publications.

**Centrifugal Pumping Machinery.**—Morris Machine Works, Baldwinsville, N. Y. Illustrated catalogue. Size 6 x 9 inches; pages 90. Treats of a great variety of centrifugal pumping machinery and engines for driving them. Belt driven and direct connected motor driven types are also shown. The pumps are built in horizontal and vertical patterns, single and multiple stage types, for a wide range of delivery pressures. Styles are shown particularly adapted for hydraulic dredging. Much useful information in the way of data, tables, &c., is included. The latter part of the catalogue deals with simple and compound vertical marine engines.

**Milling Machines.**—Garvin Machine Company, Spring and Varick streets, New York City. Pamphlet. Illustrated. Gives engravings and very brief notes concerning the following machines: Universal, plain, Lincoln, manufacturing, vertical, duplex, hand and profile milling machines; cutter grinding machines, surface grinders, die and screw slotters, screw and tapping machines, monitor chucking lathes, spring coiling machines, hand lathes, gang drill presses and duplex drill lathes. An inclosed leaf refers to a geared circulating pump used largely by automobile manufacturers.

**Cement Concrete.**—Cement Department of the Illinois Steel Company, The Rookery, Chicago. Booklet; cloth bound; size 6 x 9 inches; pages 18. Title, "Facing and Finishing Exposed Concrete Surfaces." Reprinted abstract from "Reinforced Concrete," by A. W. Buel and C. S. Hill, published by the Engineering News Publishing Company, New York. Distributed gratuitously in the interest of Universal Portland cement, for the manufacture of which this company has a capacity of 6000 barrels per day.

**Slag Ladles and Cars.**—Wellman-Seaver-Morgan Company, Cleveland, Ohio. Small catalogue. Confined to an illustrated description of Dewhurst patent slag ladles and cars, for the manufacture of which this company has the American rights. These ladle cars were described in *The Iron Age* February 23, 1905. The back part of the catalogue contains a list of users of the ladles and cars and a list of the products of the Wellman-Seaver-Morgan Company.

**Engines.**—Watertown Engine Company, Watertown, N. Y. Illustrated catalogue; size 7 x 9 inches; pages 32. Contains engravings and descriptions of examples of the extensive line of steam engines built by this company. These include high, medium and low speed, horizontal and vertical, simple and cross and tandem compound engines, ranging from 15 to 1500 horse-

power. The text explains arrangements for generator connections and the various types of valves, such as the single valve, flat balanced four valve and Corliss valve.

**Refrigerating Machinery.**—De La Vergne Machine Company, East 138th street, New York City. Folder. Illustrates and describes briefly various types of refrigerating and ice making machines. These include standard horizontal machines of 100 tons capacity, cross compound machines of 500 tons capacity and small motor driven sets of 5 tons capacity.

**Plant Designing.**—Dodge & Day, Nicetown, Philadelphia, Pa. Bulletin 175. Subject, "A Modern Industrial Plant." Contains a description of the modernized plant of the Jeannesville Iron Works at Hazleton, Pa. This plant was illustrated in *The Iron Age* December 1, 1904. The bulletin also contains a few words in regard to the methods employed by Dodge & Day in the conduct of their business.

**Hydraulic Machinery.**—William H. Wood, Media, Delaware County, Pa. Catalogue; size, 4 1/4 x 6 1/4 inches; pages, 86. Devoted to hydraulic machinery, including multiple pressure hydraulic riveters of various sizes, portable hydraulic riveters, heavy flanging presses, forging presses, forming machines, stamping presses, angle and channel shearing machines, horizontal and vertical punches, bending and straightening presses and hydraulic wall and jib cranes. Also a line of pumps and accumulators for the operation of hydraulic machinery, and special valves and fittings. A list of users of Wood's hydraulic machinery and a number of testimonial letters are appended.

**Lathes.**—L. Robbins, Worcester, Mass. Illustrated catalogue. Confined to engine lathes and pattern makers' lathes. The engine lathes are made in 13, 15, 16, 18 and 20 inch sizes, and the pattern makers' lathes in 16, 20 and 24 inch sizes. An illustration is given of each with a short description and specifications covering the regular attachments and special variations.

**Gears.**—Boston Gear Works, Purchase and Pearl streets, Boston, Mass. Illustrated catalogue E of standard gears and price-list. Covers bevel, spur and internal gears and racks, universal joints and spiral and helical gears as specialties. Mention is made of the fact that the company has recently installed new and special tools for generating perfect tooth curves, by the use of which greater accuracy is obtained. The list given of sizes and prices covers a very wide range. Supplementary catalogue W deals with automobile gears and supplies.

**Gas and Oil Engines.**—De La Vergne Machine Company, East 138th street, New York. Folder. Pertains to Koerting gas engines made in single cylinder four-cycle single acting form in capacities from 65 to 360 horse-power, and two-cycle double acting form in sizes from 400 to 3000 horse-power. Also deals with Hornsby-Akroyd oil engines, using as a fuel crude oil or kerosene. These are made in single cylinder and twin cylinder patterns in sizes from 1/2 to 125 horse-power.

**Furnaces, Producers and Valves.**—Forster-Miller Engineering Company, Pittsburgh, Pa. Illustrated catalogue; size, 9 x 12 inches; pages, 61. Makes profuse use of large sectional line drawings to show the construction of the apparatus presented. These appear on alternate pages and descriptions attend them on the facing pages. The apparatus so shown includes the Forster water sealed gas producer, bell and hopper feeding devices for gas producers, charging machine for annealing furnace, water controlled reversing valves, welding furnace, coal fired billet furnace, gas fired continuous billet furnace, movable bottom continuous heating furnace, muffle annealing furnace, continuous regenerative muffle furnace, coal and gas fired and recuperative coal fired annealing furnaces, gas and coal fired sheet and pair furnaces, crucible, air, pit and open hearth furnaces, mixer, blast furnace, and hot blast stove. Other illustrations show notable installations.

**Threading and Tapping Machinery.**—Reliance Machine & Tool Company, Cleveland, Ohio. Illustrated catalogue; size, 6 x 9 inches; pages, 56. Devoted to bolt threading, pipe threading, and nut tapping machinery and accessories. The construction and operation of the Reliance opening die head is described exhaustively. This head is made in four-die form for bolt threading and in six-die form for pipe threading. The details of the construction of the various machines are similarly given. The single bolt cutters are made in 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4 and 6 inch sizes. The double bolt cutters are made in the same sizes up to 2 1/2 inches. Single stay bolt cutters are made in 1 1/2 and 2 inch sizes and double stay in 1 1/2-inch. Triple bolt cutters are made in 1, 1 1/2 and 2 inch sizes. Motor driven bolt cutters are made in 1 1/2, 2 and 3 inch sizes. Valuable reference tables are added in the back of the book.

**Smokeless Furnaces.**—Murphy Iron Works, Detroit, Mich. Illustrated catalogue; size, 6 x 9 inches; pages, 31. Gives a rather interesting account of the development of the Murphy automatic smokeless furnace. In the present improved pattern it is automatic in all its functions, feeding and distributing the coal mechanically and removing the ashes and refuse. It is adaptable to any type of boiler and to units of any size. The illustrations show the furnace applied to boilers of various standard types. The details of the construction of the furnace are separately illustrated, and are scattered through an exhaustive description. Views of a number of notable installations are appended.



## The Iron and Metal Trades

From all the principal distributing markets come the reports that in the raw material, Pig Iron, the buying movement is almost arrested. Many producing interests take the ground that a time like this is not one to force sales and are withholding. On the other hand, buyers are not being tempted by such concessions as are being made, like, for instance, the recent lowering of Southern Iron to the \$13 basis. While many consumers are well covered, in some instances into the fourth quarter, others have all along fought the advances made and are still purchasing in small parcels for very prompt delivery.

Thus far, on the whole, the demand from the general foundry trade has not developed an increase at all in proportion to the swelling of the requirements of the Steel trade. This, however, may be explained partly by the fact that the product of many foundries is in highly finished forms, for which the demand follows after industrial expansion has had full headway. We need only instance machinery for the expansion of old plants and the building of new manufacturing works.

The demand for Steel Billets continues fair and there is still some scarcity. An interesting development is the buying of Ingots by two Plate mills in central Pennsylvania in the place of Slabs.

The volume of business in the heavier lines of Finished Iron and Steel is heavy and the amount of tonnage in sight is large. It is probable that the 21,000 tons of Structural Material for the Pennsylvania station in this city will go to a central Pennsylvania mill. The whole undertaking will call for about 50,000 tons. The contract for the 20,000 tons of material for the Philadelphia Rapid Transit has not yet been actually signed. The flow of tonnage for new buildings and manufacturing plants is ample and steady.

Among the Rail orders lately placed is one lot of 14,000 tons for Cuba.

It is in the lighter lines of Finished Iron and Steel that the situation is less satisfactory. It almost looks as though the jobbing trade had overbought early in the year. It is certain that some of these interests are making efforts to move their goods by offering concessions. Reports are conflicting as to the degree of success which is attending their efforts, and there is some talk of measures on the part of some manufacturers to back them up.

The feeling is abroad that a fresh buying movement cannot be well expected until well into June and that the crop prospects will have a decided influence upon the movement.

Observers here are watching the English warrant market with interest, since it looks as though a corner is developing. The rise in Pig Iron in the face of steadily increasing stocks in England was attributed to the expectation, which at one time seemed justified, that we would be forced to buy considerable quantities of Pig Iron abroad. When it became evident that our production was expanding at an unlooked for rate short selling began, and it is these operators who are to be squeezed.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,  
Declines in Italics.

At date, one week, one month and one year previous.

May 17, May 10, Apr. 19, May 18,  
1905. 1905. 1905. 1904.

### PIG IRON:

Foundry Pig No. 2, Standard, Philadelphia .....	\$17.25	\$17.50	\$17.75	\$14.50
Foundry Pig No. 2, Southern, Cincinnati .....	15.75	15.75	16.25	12.00
Foundry Pig No. 2, Local, Chicago .....	17.25	17.25	17.25	13.75
Bessemer Pig, Pittsburgh .....	16.10	16.10	16.35	13.60
Gray Forge, Pittsburgh .....	15.60	15.60	15.65	12.50
Lake Superior Charcoal, Chicago .....	17.50	17.50	18.50	15.00

### BILLETS, RAILS, &c.:

Steel Billets, Pittsburgh .....	23.00	24.00	24.00	23.00
Steel Forging Billets, Pittsburgh .....	26.00	27.00	27.00	....
Steel Billets, Philadelphia .....	27.00	28.00	28.00	24.25
Steel Billets, Chicago .....	28.00	28.00	28.00	24.00
Wire Rods, Pittsburgh .....	34.00	34.00	34.00	30.00
Steel Rails, Heavy, Eastern Mill .....	28.00	28.00	28.00	28.00

### OLD MATERIAL:

O. Steel Rails, Chicago .....	13.00	13.00	14.75	10.00
O. Steel Rails, Philadelphia .....	16.50	16.75	18.00	12.50
O. Iron Rails, Chicago .....	18.50	18.50	19.50	16.00
O. Iron Rails, Philadelphia .....	22.50	22.50	24.00	15.00
O. Car Wheels, Chicago .....	15.00	15.00	16.00	13.00
O. Car Wheels, Philadelphia .....	16.00	16.00	17.00	12.00
Heavy Steel Scrap, Pittsburgh .....	14.50	15.00	16.00	11.75
Heavy Steel Scrap, Chicago .....	12.50	12.50	14.50	9.50

### FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia .....	1.73½	1.73½	1.73½	1.48½
Common Iron Bars, Chicago .....	1.55	1.55	1.60	1.40
Common Iron Bars, Pittsburgh .....	1.55	1.55	1.65	1.35
Steel Bars, Tidewater .....	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh .....	1.50	1.50	1.50	1.35
Tank Plates, Tidewater .....	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh .....	1.60	1.60	1.60	1.60
Beams, Tidewater .....	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh .....	1.60	1.60	1.60	1.60
Angles, Tidewater .....	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh .....	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh .....	1.50	1.55	1.65	1.40
Skelp, Sheared Steel, Pittsburgh .....	1.55	1.60	1.70	1.40
Sheets, No. 27, Pittsburgh .....	2.30	2.30	2.30	2.10
Barb Wire, f.o.b. Pittsburgh .....	2.25	2.25	2.25	2.50
Wire Nails, f.o.b. Pittsburgh .....	1.80	1.80	1.80	1.90
Cut Nails, f.o.b. Pittsburgh .....	1.80	1.80	1.80	1.75

### METALS:

Copper, New York .....	15.00	15.00	15.25	13.12½
Spelter, St. Louis .....	5.30	5.45	5.77½	5.00
Lead, New York .....	4.50	4.50	4.50	4.50
Lead, St. Louis .....	4.45	4.47½	4.47½	4.37½
Tin, New York .....	30.00	29.90	30.40	27.87½
Antimony, Hallett, New York .....	8.75	8.75	8.25	7.00
Nickel, New York .....	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York .....	3.74	3.74	3.74	3.64

## Chicago.

FISHER BUILDING, May 17, 1905.—(By Telegraph.)

There is no material change in the general Iron and Steel situation since last week, except that \$13 to \$13.25 is now quite openly the Birmingham basis on which many Southern producers are offering Foundry Iron. Unfortunately for the factors who made the reduction, it has not resulted, as far as can be learned, in any increased tonnage, and has only had the result of inducing buyers to hold off indefinitely before they close their contracts for the second half of the year. The tone on Billets is a little easier, but both Billets and Sheet Bars are still scarce. There is quite a little tonnage moving in Standard Section Rails, and the demand for Light Rails and Track Supplies is active. An office building in Chicago, calling for 1900 tons of Structural Steel, was placed with a local steel worker, who ordered his material from the Carnegie Steel Company. Premiums are still paid for prompt shipment of Angles, Beams and Channels from 3 to 8 inch sections. Premiums have disappeared from the Plate market, however, and the mill situation is considerably easier. The sale of Sheets is very small, as buyers everywhere seem to be covered with contracts made at \$6 to \$8 a ton lower than present prices. Specifications on contracts are liberal. Pipe is weak and the official prices still published by the leading producer are considered nominal rather than actual. The demand for Boiler Tubes is still active, particularly for locomotive sizes and gauges. Cast Iron Pipe foundries are all busy and are likely to be kept so indefinitely. Old Materials are possibly a little weaker than at last report. Coke is from 10c. to 25c. a ton lower than it was a week ago and the demand is very light. Independent Wire manufacturers have decided to curtail production by closing down their plants one month out of the 12. Most of these plants will be closed in July.

**Pig Iron.**—The Pig Iron market is in a condition where even the offers to sell at \$13, made by several Southern producers, have not tempted orders from their hiding. Price cutting has retarded rather than stimulated buying, because every indication of weakness on the part of the seller is taken advantage of by the buyer and is considered to be only a forerunner of a general slump in prices. At the present time this is a buyers' market, but it is poised on such a delicate balance that it will not require much to turn it into a sellers' market, with buyers bidding against each other for tonnages to cover the second half of the year. Local Northern Irons have not officially receded from their long maintained position of \$17, at the furnace, or \$17.25 to \$17.50, Chicago. There is very little business being done in either Northern or Southern Iron. We reduce prices on Southern Iron to the minimum basis of \$13, Birmingham, for No. 2, though it is recognized that there are still some producers who refuse to go as low as that figure. Quotations are as follows:

Lake Superior Charcoal.....	\$17.50 to \$18.00
Northern Coke Foundry, No. 1.....	17.75 to 18.00
Northern Coke Foundry, No. 2.....	17.25 to 17.50
Northern Coke Foundry, No. 3.....	16.75 to 17.00
Northern Scotch, No. 1.....	18.00
Ohio Strong Softeners, No. 1.....	18.50
Ohio Strong Softeners, No. 2.....	18.00
Southern Silvery, 4 to 6 per cent. Silicon.....	18.50 to 19.50
Southern Coke, No. 1.....	17.15 to 17.65
Southern Coke, No. 2.....	16.65 to 17.15
Southern Coke, No. 3.....	16.15 to 16.65
Southern Coke, No. 4.....	15.90 to 16.40
Southern Coke, No. 1 Soft.....	17.15 to 17.65
Southern Coke, No. 2 Soft.....	16.65 to 17.15
Southern Gray Forge.....	15.65 to 16.15
Southern Mottled and White.....	15.40 to 15.90
Malleable Bessemer.....	17.50
Standard Bessemer.....	18.30 to 18.80
Jackson Co. and Ky. Silvery, 6 % Silicon.....	19.80
Jackson Co. and Ky. Silvery, 7 % Silicon.....	21.30
Jackson Co. and Ky. Silvery, 8 % Silicon.....	22.30
Jackson Co. and Ky. Silvery, 10 % Silicon.....	23.30
Alabama Basic.....	17.65
Virginia Basic.....	17.65

**Billets.**—Open Hearth Forging Billets in from car lots up sell at from \$30 to \$32 a gross ton for base sizes, with the usual extras. Bessemer Rolling Billets would be quoted at \$28 to \$30. The tone is a little easier, though Billets are still scarce and hard to get.

**Rails and Track Supplies.**—Something like 7000 tons of Rails were placed in Chicago with the Carnegie mill, and inquiry for Rails is fairly active. Business in Light Sections is increasing and prices are firm. Demand for Track Supplies is excellent and mills are fully occupied. We repeat last week's quotations as follows: Standard Section Rails \$28 per gross ton at maker's mill in 500-ton lots or greater, plus full freight to destination; Light Section Rails, \$24 to \$27 per gross ton, according to weight and tonnage; Angle Bars, 1.40c. to 1.50c.; Spikes, 1.75c. to 1.85c., f.o.b. Joliet, in car lots; Track Bolts, 2.40c. to 2.50c., base, with Square Nuts, and 10c. to 15c. higher for Hexagon Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

**Structural Materials.**—Contract for the Borland Building, at the southeast corner of La Salle and Monroe streets, has just been let to contractors. The Smeeth Copper & Bronze Company has the Steel contract, which will aggregate about 1900 tons. The Steel ordered has been placed by these contractors with the Carnegie Company. The local independent mill is finding a ready market for its Structural Sections at from \$1 to \$2 a ton above official prices. The shortage on Structural Steel is principally in the smaller sections, ranging from 3 to 8 inches. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices for either random lengths or cut to lengths on Angles, Beams and Channels, base sizes, range from 2.10c. to 2.25c., with the usual extras for size.

**Plates.**—Premiums are no longer being paid for prompt delivery, and the general Plate situation has eased off to the point where consumers are always able to find some mill that is in shape to make practically immediate shipment of their requirements. Many firms, though holding contracts with the leading producers at prices lower than to-day's, are forced to pay full market prices to some independent mill in order to secure delivery. Official prices are unchanged as follows: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, Tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows:

Tank Plate, ¼-inch and heavier up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch upon to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

**Sheets.**—There is no improvement in the Black Sheet market, and Galvanized Sheets are beginning to take on a weaker tone. The great bulk of the Sheet tonnage now being shipped to consumers was bought on the basis of from \$6 to \$8 a ton lower than present prices. Local jobbers who bought heavily at about the basis of 2c., Pittsburgh, for No. 28 gauge Black Sheets can shade the present official market and still make a handsome profit. How much this is being done is a question. Official quotations for car lots in base sizes are as follows: Blue Annealed Sheets, Nos. 9 and 10, 1.91½c.; Box Annealed Sheets, Nos. 18 and 20, 2.31½c.; do., No. 27, 2.47½c.; do., No. 28, 2.56½c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.55c. for Nos. 18 and 20 Box Annealed, 2.70c. for No. 27 Box Annealed and 2.80c. for No. 28 Box Annealed. Galvanized Sheets are officially quoted at the following minimum prices at Chicago, in car lots from mill, base sizes: No. 10, 2.51½c.; Nos. 18 and 20, 2.86½c.; No. 27, 3.41½c.; No. 28, 3.61½c. Some mills ask 5c. and 10c. higher. Minimum store prices on Galvanized, base widths, are: Nos. 10, 12 and 14, 3.10c.; Nos. 22 and 24, 3.25c.; No. 27, 3.70c.; No. 28, 3.95c., with the usual differentials between gauges and extras for widths and lengths.

**Bars.**—On desirable lots of Iron Bars 1.50c., Chicago, has been quoted, but the market may be said to be at 1.55c., base, half extras, in car lots. Steel Bars are being held officially at 1.50c., Pittsburgh, or 1.66½c., Chicago, base, half extras, but only a small tonnage is being placed at this figure, as consumers are almost all covered at a lower basis. Hoops are still quoted at 1.81½c., full extras, Chicago. Soft Steel Angles and Shapes are unchanged at 1.57½c., half extras, and Hard Steel Angles and Bars about 10c. below the price for Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

**Merchant Steel.**—A good many large implement firms covered on their Bar specifications for the balance of this year or extended into 1906 before the Bar prices were advanced from 1.40c. to 1.50c. basis. About the usual amount of inquiry for contracts for the ensuing year from the implement concerns and other large users of this class of goods is in evidence. In the main there is a disposition to await developments before closing long time contracts. Prices are firm, as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.23½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

**Merchant Pipe.**—It now develops that prices of Merchant Pipe have become so badly demoralized that a meeting was called last week in Pittsburgh, at which the independent manufacturers took steps to prevent shading below the schedule of last November. It is positively stated by large interests that Pipe has at no time been actually higher than the November schedule, which was on the basis of 78½ per cent., Pittsburgh, to jobbers for Black Steel Pipe, base size, ¾ to 6 inches, or 77 per cent. to consumers, as against 76 per cent., which has been the official card since then. The following official discounts, then, may be taken as only nominal, one to two points better being actual going prices: Black Steel, 73.35; Galvanized Steel, 63.35; Black Iron, 71.85; Galvanized Iron, 61.85, with the customary differentials for larger and smaller diameters and for X and XX strong.

**Boiler Tubes.**—The market for Boiler Tubes is active, and mills seem to be fully employed, some of them being very far behind their orders. The following discounts on car lots, from mill at Chicago, prevail: Base sizes, ¾ to 5 inches, Steel Tubes, 60.35; Iron, 49.35; Seamless Steel, 52.85. Larger and smaller diameters take the usual extras in price and less than car lots are quoted at two points less discount. We quote from store:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1½ to 2¼ inches.....	50	35	35
2½ inches.....	52½	35	38
2½ to 5 inches.....	60	47½	42½
6 inches and larger.....	50	35	..

**Cast Iron Pipe.**—No contracts of 500 tons or greater have been entered into by the leading producer within the last week, but all the operative mills of that company are fully employed and business is excellent. We quote ordinary lots at \$29 a gross ton for 4-inch Pipe and \$28 for 6-inch and larger, with \$1 a ton higher for Gas Pipe.



**Old Materials.**—No railroad lists have been closed within the last few days, and for that reason it is hard to get a definite line on the market. Prices in the main do not seem to have receded greatly from the prices quoted last week. There is very little demand and almost no trading in Scrap of any kind, but there is a considerable tonnage to be bought in this market and orders will be placed as soon as prices reach a level that buyers satisfy themselves is the minimum. We quote:

Old Iron Rails.....	\$18.50 to \$19.00
Old Steel Rails, 4 feet and over.....	14.00 to 14.50
Old Steel Rails, less than 4 feet.....	13.00 to 13.50
Heavy Relaying Rails, subject to inspection.....	22.25 to 22.75
Heavy Relaying Rails, for side tracks.....	19.50 to 20.00
Old Car Wheels.....	15.00 to 15.50
Heavy Melting Steel Scrap.....	12.50 to 13.00
Frogs, Switches and Guards.....	12.50 to 13.00
Mixed Steel.....	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates.....	\$15.50 to \$16.00
Iron Car Axles.....	20.00 to 20.50
Steel Car Axles.....	16.00 to 16.50
No. 1 Railroad Wrought.....	14.00 to 14.50
No. 2 Railroad Wrought.....	13.00 to 13.50
Shafting.....	15.00 to 15.50
No. 1 Dealers' Forge.....	11.00 to 11.50
Wrought Pipes and Flues.....	9.50 to 10.00
No. 1 Cut Bushelling.....	9.00 to 9.50
Iron Axle Turnings.....	9.50 to 10.00
Soft Steel Axle Turnings.....	9.50 to 9.75
Machine Shop Turnings.....	9.00 to 9.25
Cast Borings.....	7.00 to 7.50
Mixed Borings, &c.....	7.00 to 7.50
No. 1 Mill.....	8.50 to 9.00
Country Sheet.....	7.00 to 7.50
No. 1 Rollers, cut to Sheets and Rings.....	9.25 to 9.50
No. 1 Cast Scrap.....	12.50 to 13.00
Stove Plate and Light Cast Scrap.....	9.00 to 9.50
Railroad Malleable.....	12.50 to 13.00
Agricultural Malleable.....	11.50 to 12.00

**Metals.**—Business is very quiet and prices are weak. We quote as follows: Casting Copper is unchanged at 14 $\frac{1}{2}$ c. to 15c., but Lake is  $\frac{1}{8}$ c. lower, being held at 15c. to 15 $\frac{1}{2}$ c. in car lots, with  $\frac{1}{4}$ c. to  $\frac{1}{2}$ c. higher for small lots. Lead is unchanged, being quoted in 50-ton lots at 4.55c., in car lots at 4.60c., and 5c. to 5.25c. in small lots. Pig Tin is  $\frac{1}{2}$ c. lower, being quoted at 30 $\frac{3}{4}$ c. to 31 $\frac{1}{4}$ c. in car lots and 31 $\frac{1}{2}$ c. to 32c. in less than car lots. Spelter is in slow demand, but unchanged at 5.75c. for car lots and 6c. for small lots. Sheet Zinc is held at \$7.25, base, La Salle, equivalent, after deducting discounts, to \$7, Chicago, for car lots of 600-lb. casks, with small lots selling at \$7.50 to \$8. Prices of Old Copper and Brass are as follows: Copper Wire, 13 $\frac{1}{4}$ c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12 $\frac{3}{4}$ c.; Red Brass, 11 $\frac{1}{4}$ c.; Red Brass Borings, 9 $\frac{1}{4}$ c.; Yellow Brass, Heavy, 8 $\frac{1}{2}$ c.; Yellow Brass Borings, 7 $\frac{1}{2}$ c.; Light Brass, 7c.; Lead Pipe, 4 $\frac{1}{4}$ c.; Tea Lead, 3.85c.; Zinc, 4.35c.; Pewter, No. 1, 19 $\frac{1}{4}$ c.; Block Tin Pipe, 25c.

**Coke.**—Coke is weaker, \$2.50 to \$2.75, at the ovens, being the range of strictly 72-hour Connellsville Foundry quality and about \$2.25 to \$2.50, at the ovens, the price for first-class Foundry Cokes from other districts. Furnace Cokes range from \$1.75 to \$2, at the ovens. Add \$2.65 for freight from the Pennsylvania and West Virginia fields to Chicago.

## Philadelphia.

FORREST BUILDING, May 16, 1905.

After what has been said during the past two or three weeks there is not much room for further comment in regard to the Iron and Steel situation. There is absolutely no change except that the market for raw materials is duller and that buyers are more determined than ever to keep out of the market. It is remarkable that this condition of affairs is confined mainly to Pig Iron, to Scrap Material and to a few of the lighter materials, while the heavier lines are about as busy as they well can be. These are abnormal conditions, of course, and must necessarily be adjusted in the not very distant future, but how it is to be brought about is a problem that will have to solve itself. Appearances indicate that the output of Pig Iron has outrun consumption, and while there is no distinct evidence of any decline in the latter or that there is likely to be, there is a general conviction that too much Pig Iron is being made and that the output must be reduced or prices will go lower. We make this statement not because it is a certainty, but because sentiment leans that way, and in such times as these sentiment goes a long way to produce results—temporarily at all events. If production is at the rate of 2,000,000 tons per month, and consumers are covered for four to six months on 75 per cent. of that, they can do without buying for two or three months longer; but if the entire current output is required to fill contracts the appearance of the market will undergo a very marked change inside 60 or 90 days, even if the buying continues as light as it is at the present time. Stocks are absurdly small for the amount of business being done, and while there may be a brief reaction in prices, there is certainly no basis for the talk so freely indulged in of a culmination of activity in the Iron and Steel trade and of a general weakness in prices. It is almost certain that May

and June will be dull months and that Pig Iron may go a little lower, but, as we said before, there is no evidence of impaired conditions, but, on the contrary, there is just as much reason for expecting a heavy business during the last half of the year as there was when buyers were scrambling for all the Iron in sight. Something unforeseen may yet occur to change the outlook, but thus far the tendency has been all in the direction of improvement, and for the present prospects could not be much better than they are at this time, although buying is at the lowest point for many weeks past.

**Pig Iron.**—There is hardly enough business to make exact prices. Such small lots as may be required are taken at the old prices, but new business in any volume is not within sight, so that what sort of prices would rule if there was a demand is more or less a matter of opinion. High grade Foundry Irons are scarce and command full prices, but there is a great deal of irregularity when it comes to the lower qualities, and for that matter, indeed, there is irregularity all the way through. The indisposition to buy is not remarkable in itself, for the very good reason that nearly everybody has all the Iron engaged that is likely to be needed in the next four or five months, but because Iron can be had now on slightly better terms than when they bought consumers seem to have lost all interest in the market. There can be no doubt that the supply of Pig Iron is in excess of what was figured upon, and, as a matter of fact, a semifamine of Pig Iron was expected by a great many, and because there is no probability of any such contingency the revulsion of feeling is very complete. But this does not alter the fact that the country is just as prosperous as ever and that the consumption of Pig Iron keeps well up to the highest limits that were set for it. The real truth is that there is just a little more Pig Iron than was calculated upon (not that less is being used than was calculated upon), and this very trifling excess, which can only be temporary, seems to have taken all the life out of the market. Presumably the outcome will be a curtailment in the production and then perhaps sentiment will change the other way. However that may be, prices to-day are very soft, particularly in the lower grades, although for such lots as buyers are willing to take prices are about as follows for Philadelphia and nearby deliveries:

No. 1 X Foundry.....	\$18.00 to \$18.25
No. 2 X Foundry.....	17.25 to 17.75
No. 2 Plain.....	16.75 to 17.00
No. 3 Foundry.....	16.00 to 16.25
No. 4 Foundry.....	14.50 to 15.00
Standard Gray Forge.....	15.50 to 16.00
Basic.....	16.50 to 16.75
Low Phosphorus.....	20.50 to 20.75

**Steel.**—There has been a good deal of activity in Steel, some of the large nearby mills having taken a heavy tonnage of ingots at something around \$24, delivered. There is also a good demand for Billets, although prices are lower, and they can be had at about \$27 for first-class business. Prospects indicate considerable activity in the near future, as consumption is very large.

**Muck Bars.**—There is practically no demand, so that \$29 is a nominal quotation, which might not be shaded much unless cheaper Pig Iron can be had.

**Plates.**—There is an extraordinarily heavy demand for Plates and mills are quite unable to handle all their business satisfactorily. This is in some measure due to the shortage of room in the yards, so that both inward and outward shipments are considerably delayed at many of the mills. This may be temporary, but there is strong evidence that the Plate mills will be hard pushed for a long time to come. Prices unchanged, but May and June shipments command a slight premium:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide.....	1.73 $\frac{1}{2}$	1.78 $\frac{1}{2}$
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under.....	1.63 $\frac{1}{2}$	1.68 $\frac{1}{2}$
Flange or Boiler Steel.....	1.83 $\frac{1}{2}$	1.88 $\frac{1}{2}$
Marine, A. B. M. A. and Commercial Fire Box Steel.....	1.93 $\frac{1}{2}$	1.98 $\frac{1}{2}$
Still Bottom Steel.....	2.03 $\frac{1}{2}$	2.08 $\frac{1}{2}$
Locomotive Fire Box Steel.....	2.23 $\frac{1}{2}$	2.28 $\frac{1}{2}$
The above are base prices for $\frac{1}{4}$ -inch and heavier. The following extras apply:		
3-16-inch thick.....	\$0.10	pounds extra.
Nos. 7 and 8, B. W. G.....	.15	"
No. 9, B. W. G.....	.25	"
Plates over 100 to 110 inches.....	.05	"
Plates over 110 to 115 inches.....	.10	"
Plates over 115 to 120 inches.....	.15	"
Plates over 120 to 125 inches.....	.25	"
Plates over 125 to 130 inches.....	.50	"
Plates over 130 inches.....	1.00	"

**Structural Material.**—The outlook in this department is giving some uneasiness to manufacturers, as they see great difficulty in meeting the demand. Orders on the books are so heavy that it will require months to get reasonably clear of the business already in hand, and there is more coming in sight almost daily. Bridge work, elevator work and tunnel work, besides large buildings, are furnishing an enormous tonnage, so that the situation is safe beyond peradventure. Philadelphia, Baltimore and Washington are furnishing

thousands of tons of new business, which must be put through to a large extent during 1905, besides which other cities are by no means behind in the procession. Most orders are taken subject to delays, although in some cases special prices secure June or July deliveries. Official prices are unchanged as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

**Bars.**—It cannot be said that there is any special activity at the Bar Iron mills, but as a rule they are running full on specifications for business taken some time ago. There is also some good new business, but the volume is not beyond what can be easily handled. Steel Bars are very active, however, the difference in price being somewhat in their favor—viz., 1.63½c. to 1.65c., against 1.73½c. to 1.75c. for Refined Bar Iron.

**Sheets.**—There is a fair demand, but it is mostly for prompt shipments of small lots. Prices are about as follows on that class of business, but a little better might be done on large orders for extended deliveries: 18 to 20 gauge, 2.40c.; 22 to 24 gauge, 2.50c.; 25 and 26 gauge, 2.60c.; 27 gauge, 2.70c., and 28 gauge, 2.80c. Best grades are two to three tenths higher.

**Old Material.**—It is weeks since there was anything like a steady market. Bids could not be had at any reasonable figure, so that holders simply had to bide their time. A good many forced sales were made, but there appears to be some return of confidence, and buyers who wanted nothing at any price two or three weeks ago are now disposed to give some consideration to bargain counter lots. It may not amount to anything immediately, but it looks as though the worst was over, although the following quotations are merely a guess at what buyers might accept for deliveries in their yards:

Scrap Rails.....	\$16.50 to \$17.00
No. 1 Steel Scrap.....	16.00 to 16.50
Old Steel Axles.....	20.00 to 20.50
Old Iron Axles.....	24.00 to 25.00
Old Iron Rails.....	22.50 to 23.00
Old Car Wheels.....	16.00 to 17.00
Choice Scrap, R. R. No. 1 Wrought.....	18.00 to 19.00
No. 1 Yard Scrap.....	17.00 to 17.50
Long and Short.....	16.50 to 17.00
Machinery Scrap.....	15.25 to 15.75
Low Phosphorus Scrap.....	21.50 to 22.50
Wrought Iron Pipe.....	14.50 to 15.00
No. 1 Forge Fire Scrap.....	15.50 to 16.00
No. 2 Light Ordinary.....	10.50 to 11.00
Wrought Turnings.....	13.50 to 14.00
Axle Turnings, Choice Heavy.....	14.50 to 15.00
Cast Borings.....	10.00 to 10.50
Stove Plates.....	11.00 to 11.50

## Cleveland.

CLEVELAND, OHIO, May 16, 1905.

**Iron Ore.**—From present indications the movement of Ore down the lakes during the month of May will exceed all records for that month. There are several contributing causes. One is that the demand for Ore is exceedingly heavy. Another is that the boats available for the movement are abundant. There is hardly any demand for boats to carry coal; hence most of the vessels are running to the head of the lakes light, bringing back Ore cargoes. At this end of the line the dispatch is exceptional, delays in port being purely nominal. In most instances cargoes are discharged and the vessels leave for up the lakes on the day of their arrival. This is an exceptional situation. Last year delays in port ran from two to five days, with about three and a half days being the average. This, of course, in addition to the augmented vessel capacity, has a tremendous influence in facilitating the movement of Ore. The last cause is the unusual ease of cars and the extraordinary speed of movement on the part of the railroads. Out of Cleveland alone the lines are hauling more Ore at the present time than they have carried at this season of the year at any one time in the past. The reports indicate that the furnaces are melting this Ore.

**Pig Iron.**—The situation as to Foundry Iron is extremely dull. There is hardly any sale of material for quick shipment, since most of the furnaces are sold up and most of the foundries have covered their needs. Some of the furnaces are showing a little uneasiness about their future business, and there is an increasing tendency toward lower prices. So far no one has been driven to sacrifice his product, but a good order coming into the market at the present time would most likely result in a lowering of the price. The ruling quotations at present are \$15.75 to \$16 for No. 2 Foundry in the Valleys. There is hardly any change in the Bessemer or the Basic trade. The Southern furnaces are making a strong canvass of this territory, and there is an increasing disposition among the furnaces of that territory to sell here on the basis of \$13, Birmingham, for No. 2, while some furnaces might break under even that price to get a good order. The Coke trade is still easy, but prices have not declined further. Good 72-hour Foundry Coke is selling between \$2.60 and \$2.75 at the oven, with the best Furnace Coke selling at \$2 to \$2.25 at the oven.

**Finished Iron and Steel.**—Bar Iron is showing additional indications of weakness. The mills here are professing their inability to sell on a parity with prices obtained in the Western market, and yet the buyers are insisting upon getting down approximately to the Western basis. The result is a deadlock. Most of the mills are preparing to close July 1 and are glad of the opportunity to do so. They have bought their supply of Scrap at the higher prices, which makes the cost of production high. Quotations range from 1.55c. to 1.60c., Youngstown, although a good inquiry might bring out a price of 1.50c., Youngstown. There has been a report around that some Iron has been sold at 1.25c., Youngstown, but this does not appear to have been well founded. Mills in this territory are retiring from the market where freight rates permit the Western mills to come into competition with them. There is not much being done in Bar Steel. The consumers having contracts are specifying freely, but the agricultural implement works are waiting for more definite crop news before buying for next year, and the other consumers, moved by a spirit of caution, do not care to commit themselves beyond July 1. The price holds at 1.50c., Pittsburgh, for Bessemer, and 1.60c., Pittsburgh, for Open Hearth. There is a slightly better tone to the market for Structural Steel and Plates. This is shown in the buying of small lots, which are placed with either the jobbers or the smaller mills. The large mills continue to be congested and are in no position to take any amount of new business. Jobbers report that their business so far in May is in excess of that which was done during the entire month of April. The same condition obtains in the Plate trade. The larger mills are at present meeting heavy demands from the shipbuilding industry, which is unusually active at this time. There is continued weakness in Sheet prices. The smaller concerns are getting the bulk of the mill business, although they have not yet cut into the trade out of stock, which continues heavy. The Rail trade has eased off a little. The tractions have been the best buyers, but they have not been taking any material lately. There is a good demand for Billets, especially of the forging quality, with premium prices being paid steadily, these ranging from \$2 to \$3 above the association prices.

**Old Material.**—The market for Scrap shows progressive weakness. There is a constant lessening of demand, with a constant downward tendency of prices. The dealers have been striving to keep prices up, but have been forced to give way gradually. The situation is extremely dull and weak at present, with hardly a possibility of any change before July 1. The prices are revised and quoted as follows, most quotations being nominal, all gross tons: Old Steel Rails, \$15.50 to \$16; Old Iron Rails, \$22 to \$22.50; Old Car Wheels, \$15 to \$16; Heavy Melting Steel, \$15 to \$15.50. All net tons: Cast Borings, \$8.50; No. 1 Busheling, \$13.50 to \$14; No. 1 Railroad Wrought, \$15.50 to \$16; Iron Car Axles, \$21 to \$22; No. 1 Cast, \$13.50; Stove Plate, \$10 to \$10.50; Iron and Steel Turnings and Drillings, \$11.

## Pittsburgh.

PARK BUILDING, May 17, 1905.—(By Telegraph.)

**Pig Iron.**—It is understood that plans for the appointment of a central selling agency to handle the output of Bessemer and Basic Iron of some of the merchant furnaces in the two valleys is making progress. Attorneys are now drawing up the agreement, which will be submitted to the furnace operators for their approval at an early date. The whole Pig Iron market is exceedingly quiet and practically bare of inquiry. Bessemer and Basic Iron is nominally \$15.50 at furnace, or \$16.35, Pittsburgh, but a few small sales have been made at \$15.25 at furnace for spot shipment. The blowing out of No. 3 Ohio Furnace of the Carnegie Steel Company at Youngstown for repairs, which will take a month or more to complete, may have some effect in inducing the Steel Corporation to buy some June Iron. If the corporation does not buy any Iron next month, and the present heavy output is continued, the trade looks for a slight recession in prices of Pig Iron between now and July 1. Northern No. 2 Foundry is nominally \$15.50 at furnace, but there is no inquiry, and the same is true of Northern Forge, which we quote at \$14.75, Valley, or \$15.60, Pittsburgh, in the entire absence of either sales or inquiry. Furnace operators realize it is absolutely useless to try to sell Pig Iron under present conditions and are allowing the market to take care of itself.

**Steel.**—Inquiry for Billets and Sheet and Tin Bars for prompt shipment is not as active as it has been, and prices of Bessemer Steel are slightly easier. We quote Bessemer Billets at \$23 and Open Hearth \$24 for reasonably prompt shipment. Sheet and Tin Bars in random lengths are \$25.50 to \$26, maker's mill, for prompt delivery. For shipment in



the third quarter and last half of the year Cut Sheet and Tin Bars have sold at \$25 and in some cases slightly less at maker's mill.

**Muck Bar.**—While there is not much inquiry for Muck Bar, prices are fairly firm, owing to the fact that some of the mills in the Pittsburgh district, which roll Muck Bar, are short of puddlers. We quote best grade made from all Pig Iron at \$28, maker's mill, but on a firm offer this might be slightly shaded.

(By Mail.)

Extreme quietness continues to prevail in the whole Iron market, with the exception of Plates and Structural Steel, and indications are that the quietness will probably continue through May and June, with a picking up in the demand for all kinds of Iron and Steel early in July if we have no labor troubles at that time. The possibilities of labor troubles about July 1 are now a factor in the situation, and if the Amalgamated Association, which has been in session in Detroit for nearly two weeks, has formulated wage scales calling for advances in wages ranging from 7 to 20 per cent. it is pretty safe to assume that these demands for higher wages will not be readily granted by the manufacturers, but may be flatly refused. While it is true that prices on nearly all kinds of Iron and Steel are higher now than at this time in 1904, or when the present wage scales were made up, yet at the same time it is a fact that nearly all the tonnage on the books of the mills was placed during the winter months when prices were about on the same basis as in May and June last year, when the Amalgamated scales were formulated. In the case of Tin Plate and Sheets heavy advances in wages are to be asked, but the bulk of the business on the books of the mills in Tin Plate was taken when prices were \$3.25 and \$3.35 per box and Sheets on the basis of about 2.20c. for No. 28. These facts will be presented to the Amalgamated Wage Committee when it meets a similar committee from the manufacturers in wage conference.

There is not enough Pig Iron being sold to establish a market and furnaces realize that under present conditions it is absolutely useless to attempt to force sales by lowering prices. Consumers are not in need of Pig Iron and are out of the market, while the furnaces are filling what contracts they have and are not actively seeking new tonnage. The nominal price of Bessemer and Basic Iron is \$15.50, at Valley furnace, but it is probable a lower price would be made by some sellers if any business was offering, which is not the case. Northern No. 2 Foundry is about \$15.50, Valley furnace, but there is no inquiry for it, nor for Forge Iron, which is weak at \$14.75, Valley furnace, or \$15.60, Pittsburgh.

The demand for Steel is not quite so active as it has been and prices are a shade easier with some sellers. Bessemer and Open Hearth Billets for reasonably prompt shipment are \$23 to \$24, and Sheet and Tin Bars, \$25.50 to \$26, maker's mill. Some sales of Cut Sheet and Tin Bars for third quarter and last half of the year delivery have been made at \$25 or slightly under, maker's mill.

The demand for Finished Iron and Steel, excepting Structural Steel and Plates, is quiet, jobbers having very heavy stocks, which are commencing to move out more freely. The Wire interests held a meeting in Chicago last week and agreed to maintain present prices strictly. The demand for Wire products is said to be looking up some and the same is true of Tubular goods.

**Ferromanganese.**—We do not hear of any recent sales in this market and quote foreign 80 per cent. Ferro at \$49 to \$50 in large lots, delivered.

**Rods.**—There is not much inquiry, but we note a sale of about 250 tons of Bessemer Rods at \$34, maker's mill, which is the price quoted for both Bessemer and Open Hearth. Basic Chain Rods are quoted at \$35, maker's mill.

**Skelp.**—The local market is absolutely bare of sales and there are practically no buyers of Skelp in the Pittsburgh district, excepting Spang, Chalfant & Co. and the National Tube Company, which occasionally make small purchases. We quote Bessemer Grooved Skelp at 1.50c. to 1.55c. and Open Hearth 1.55c. to 1.60c., with \$1 advance for Sheared. Grooved Iron Skelp is about 1.60c., and Sheared, 1.65c., maker's mill.

**Steel Rails.**—No large lots have been placed since the recent Pennsylvania order for 33,500 tons. The railroads are pursuing the policy of placing orders for Rails for actual needs only, and the Rail mills are comfortably filled, but have not a great deal of tonnage ahead of them. Standard Sections are \$28 at mill, and Light Rails, \$24 to \$27, depending on weights.

**Plates.**—There is more activity in the Plate trade than in any other of the Finished lines, and on certain sizes of Plates the Carnegie Steel Company is filled up for the balance of the year and on other sizes into October. That company recently placed some of its Plate orders with other mills, as it could not make the deliveries wanted. The car interests are very heavy consumers, Pressed Steel Car, Standard Steel Car and American Car & Foundry taking 2000 tons a day or more. We quote: Tank Plate, ¼-inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100

inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges.....	\$0.10
Gauge No. 7 and No. 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
Marine, "A. B. M. A." and ordinary Fire Box Steel Plates.....	.50
Still Bottom Steel.....	.30
Locomotive Fire Box Steel.....	.50
Shell Grade of Steel is abandoned.	

**TERMS.**—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ¼ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

**Structural Material.**—Some very large jobs have been placed in the East, but the amount of local work being given out is not very heavy. The Central District & Printing Telegraph Company is in the market for a Steel building, requiring 1200 to 1500 tons, and the Pittsburgh & Lake Erie Railroad has placed a contract with Jones & Laughlin Steel Company for extensions to its machine shops at McKee's Rocks, about 800 tons. A good deal of work is in sight, and the Structural trade this year promises to be very large. The Structural concerns report trouble in getting prompt deliveries of Material, especially Open Hearth stock. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Tees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

**Sheets.**—New demand for Sheets continues quiet, largely due to the heavy stock in the hands of jobbers, which will have to be moved before the mills can reasonably expect to receive much new tonnage. There is still some unevenness in prices, especially among jobbers, who are inclined to make concessions to move stocks more freely. Prices of Roofing Sheets are rather weak, some mills shading the official figure about \$2 a ton. Mill prices, which are shaded more or less depending on the order, are as follows: Black Sheets, No. 24, box annealed, one pass through cold rolls, 2.15c.; No. 26, 2.25c.; No. 27, 2.30c., and No. 28, 2.40c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.23c.; No. 28, 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.65 to \$1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at \$2.85 to \$2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

**Iron and Steel Bars.**—A fair amount of tonnage is being placed in Iron and Steel Bars, but the large implement makers seem disposed to hold off placing season contracts until the market is more settled. Consumers who have contracts placed when prices were lower than they are now are specifying quite liberally, and several of the leading Steel Bar mills are pretty well sold up to September 1. The weakness in Scrap is having a sympathetic effect on Iron Bars, which we quote at 1.55c., Pittsburgh, but which price might be shaded for good orders and desirable specifications. We quote Bessemer and Open Hearth Steel Bars at 1.50c. for carloads and larger lots, with the usual differential for small lots.

**Hoops and Bands.**—There is practically no new business being placed in either Hoops or Bands, but buyers are specifying fairly liberally on old contracts made at low prices. We quote Steel Hoops at 1.65c. and Bands at 1.50c., extras on the latter as per National Steel Bar card.

**Cotton Ties.**—The mills are now filling contracts placed several weeks ago, when prices were fixed. We quote Cotton Ties at 85c. per bundle for 3000-bundle lots and over.

**Tin Plate.**—The Tin Plate trade is quiet as far as new business is concerned, but the mills are running on old contracts, on which buyers are specifying fairly satisfactorily. The heavy stocks of Tin Plate carried by jobbers are expected to move out freely before long, or just as soon as the canning season opens. We quote 100-lb. Cokes at \$3.50 to \$3.55, base, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days.

**Merchant Pipe.**—Mills advise us that stocks of Pipe held by jobbers are moving out more freely and that the situation is slowly improving in the Merchant sizes. For

oil country goods there is absolutely no demand and indications are not bright, largely due to low prices of oil. The outside mills and some jobbers continue to name discounts about two points, or \$4 a ton, lower than the discounts of the leading interest, which to the jobbing trade in carloads are as follows:

	Merchant Pipe.		Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
1/4 and 1/2 inch.....	67	51	65	49
3/4 and 1 inch.....	71	59	69	57
1 1/2 to 6 inches.....	75	65	73 1/2	63 1/2
7 to 12 inches.....	70	55	68 1/2	53
Extra strong, plain ends,				
1/2 to 3/4 inch.....	60	48	58	46
3/4 to 1 inch.....	67	55	65	53
1 1/2 to 2 inches.....	63	51	61	49
Double extra strong, plain				
ends, 1/2 to 8 inches.	56	45	54	43

**Boiler Tubes.**—Conditions in the Boiler Tube trade are very satisfactory, the demand for Locomotive and Merchant Tubes being very heavy and the mills still unable to catch up on deliveries, on which they are four to six weeks behind. Carload discounts to consumers are as follows:

	Iron.	Steel.
1 to 1 1/4 inches.....	41	44
1 1/4 to 2 1/4 inches.....	41	44
2 1/4 inches.....	46	58
2 1/2 to 5 inches.....	53	64
6 to 13 inches.....	41	56

**Merchant Steel.**—Large season contracts are lacking, the implement makers and other consumers holding off in the belief they will be able to do better by not coming in the market at this time. The mills are pretty well filled up on contracts, on which consumers are specifying quite freely. We quote: Smooth Finished Tire, 1.70c.; Railway Spring Steel, 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Toe Calk Steel, 2c. to 2.05c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Smooth Finished Machinery Steel, 1.70c. to 1.75c.; Crucible Tool Steel, ordinary grades, 5 1/4c. to 8c.; extra grades, 10c. and upward. Demand for Shafting is fairly active and we quote Cold Rolled at 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

**Railroad Spikes.**—A moderate amount of new business is being placed and the mills are well filled up on contracts, on which the railroads are specifying very freely. We quote Spikes at \$1.70 per 100 lbs. in carloads, f.o.b. maker's mill.

**Spelter.**—The demand is very light and prices are weak and lower. Quotations at St. Louis to-day are about 5.40c., equal to 5.52 1/2c., Pittsburgh. This is the lowest price that Spelter has touched for some months.

**Coke.**—Last week shipments from the Connellsville region were over 14,000 cars, the heaviest in any one week for some months. There is practically no new demand for Furnace Coke, and recently strictly Connellsville has sold at \$1.90 a ton at oven, or slightly lower. Connellsville 72-hour Foundry Coke is quoted at \$2.50 to \$2.75 a ton to consumers. Out of 30,055 ovens in the Upper and Lower Connellsville regions 27,772 were active last week and only 2283 idle. Unless the demand for Coke soon improves some of the smaller Coke plants will have to shut down, being unable to dispose of their product.

**Iron and Steel Scrap.**—At present the Scrap market is purely a trader's one, sales being confined between dealers, consumers absolutely refusing to buy Material. It is probable the Scrap trade will be quiet in this month and June, as the mills will take in as little stock as possible until after July 1, when inventory and repairs have been made. In the absence of sales and with a good deal of Material pressing the market prices are weak and have further declined. Since the downward movement in Scrap started prices have gone off from \$1.50 to \$2 a ton and bid fair to go still lower. Dealers quote about as follows: Heavy Melting Scrap, \$14.50; No. 1 Wrought Scrap, \$17; Busheling Scrap, \$13; Bundled Sheet Scrap, \$13.50; Cast Iron Borings, \$10; Wrought Turnings, \$12; Machinery Cast Scrap, \$15; Steel Rails, short pieces, \$14.50; long lengths, \$15; Iron Rails, \$19, all in gross tons, f.o.b. Pittsburgh. We have not been advised of any sales in this market.

## Cincinnati.

FIFTH AND MAIN STS., May 17, 1905.—(By Telegraph.)

**Pig Iron.**—The market continues very quiet, and the situation is practically unchanged from what it was a week since. Considerable difference of opinion exists as to the ultimate outcome of the present state of affairs, the consensus of thought, however, tending toward a brighter view of the situation when the time shall arrive that consumers shall be forced to break the monotony and make their needs known. This, it is anticipated, will not be until some time next month, at which time it is believed the market will again take on new life as a result of this buying movement. May, which is generally looked forward to as a month of happenings, has this year been no exception, and thus far

has developed very little business. Buyers are evincing very little interest in the situation and are merely taking what they need for immediate necessities. Generally speaking, there has not been sufficient tonnage sold during the week to establish prices, and few large *bona fide* inquiries come forward. It is very difficult to predict just what the schedule would be. As conditions exist, however, prices for both Northern and Southern Iron are unchanged and are apparently well established. We have record of one sale of 500 tons of Basic which went to a rolling mill in Indiana. This is practically all the sales that have been made in this territory during the week outside of a number of small scattering lots. We are advised of but one inquiry, which comes from an Indiana agricultural concern, and is for from 300 to 500 tons, divided equally between Southern No. 2 Soft and Northern No. 1 Foundry, delivery to be made over the next four months. The leading Cast Iron Pipe industry in this territory is said to have secured some little Iron during the past two weeks, but report is that it is not at present in the market. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$16.25 to \$16.50
Southern Coke, No. 2.....	15.75 to 16.00
Southern Coke, No. 3.....	15.25 to 15.50
Southern Coke, No. 4.....	14.75 to 15.00
Southern Coke, No. 1 Soft.....	16.25 to 16.50
Southern Coke, No. 2 Soft.....	15.75 to 16.00
Southern Coke, Gray Forge.....	14.75 to 15.00
Southern Coke, Mottled.....	14.25 to 14.50
Ohio Silvery, No. 1.....	20.40 to 20.65
Lake Superior Coke, No. 1.....	17.15 to 17.40
Lake Superior Coke, No. 2.....	16.65 to 16.90
Lake Superior Coke, No. 3.....	16.15 to 16.40

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$18.50 to \$19.00
Lake Superior Car Wheel and Malleable	18.00 to 18.50

**Coke.**—Trade is said to be quiet, with a plentiful supply on hand. There are known to be a number of contracts that will have to be made between now and July that it is hoped will strengthen the market. Prices are about the same as last week. We quote best grades of Connellsville Foundry from \$2.50 to \$2.75, f.o.b. ovens.

**Plates and Bars.**—The demand for Structural and Plates is fairly well maintained, yet specifications are said to be a little more slow in coming forward. Merchant Steel is reported weak. Prices are unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, 1/4-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, 3/4 x 3-16 and heavier, 1.83c., in carload lots.

**Old Material.**—This market is said to be very quiet. Rolling mills are not as active as it was thought they would be, and consequently are not in a position to take the Scrap from dealers. Prices obtainable are unchanged from schedule of last week. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$15 to \$16 per net ton; No. 1 Cast Scrap, \$12 to \$12.50 per net ton; Iron Rails, \$18 per gross ton; Steel Rails, rolling mill lengths, \$13.50 per gross ton; Relaying Rails, 56-lb. and upward, \$23 per gross ton; Iron Axles, \$19.50 to \$20 per net ton; Car Wheels, \$16 to \$17 per gross ton; Heavy Melting Scrap, \$13 per gross ton; Low Phosphorus Scrap, \$16 to \$16.50 per gross ton.

## Birmingham.

BIRMINGHAM, ALA., May 15, 1905.

The condition of the Iron market depends largely from which point of view it is regarded. Some holders consider it as simply a rather quiet market, which will rebound at the first knock of opportunity, while there are others who think we are on the down grade and have not yet reached the bottom. Actual conditions are in favor of the maintenance of the value of Iron. But theory droops in the face of the established fact that Iron is lower. Enough Iron can be had at the basis of \$13 for No. 2 Foundry to make it "love's labor lost" to ask any more for it. There were some sales the past week on this basis, straight, and there were some transactions on the basis of \$13, with commissions allowed. Even at these values there was no rush for Iron, but there was a continuance of the call for Iron already bought and approaching delivery time. Such action could only mean that buyers were not disposed to add to their holdings and preferred to anticipate deliveries due in the immediate future and call them in. In few cases have those with contracts calling for early delivery replaced such lots by purchases of longer delivery. There are some interests that are strong and influential factors who tell your correspondent they are not offering and will not (for at least 60 days) sell any Iron at current value, for the simple reason



that they have pinned their faith to higher values. This may be a case of "all things come to him who waits."

The business concluded the past week was trifling. Some few orders came by the usual channels and were filled on the basis of \$13.25 and \$13.50 for No. 2 Foundry, but the sum total of the entire week did not equal the business of one day on an ordinary market. A small lot of Analysis Iron carrying 2 per cent. of silicon went at \$13.25, and one seller parted with some No. 2 Soft at \$13.50. The aggregate sales were hardly sufficient to establish quotations. Some retail lots of the other grades were sold at the usual differences between grades. In this way a small lot of Basic Iron was sold at \$14, and also some No. 1 Soft.

The outstanding sales for the last half of the year have been a matter of discussion and some outside inquiry has been made concerning them. We can state with certainty that while there have been some sales they are of no moment. When buyers were in the humor for such purchases the sellers were offish, and because of that the transactions were quite limited. When the sellers subsequently repented and made offers then the buyers retreated.

We are, of course, piling up some Iron, but if the buying movement now overdue sets in in the near future we won't have enough to satisfy the demand. Take out the Iron that will fall due the balance of this quarter on past sales and what may be left will be so small that it will cut no figure in stock on hand. Two or three days of active buying will absorb any surplus that may have accumulated.

The situation regarding output is still about the same as these letters of late have stated. There is no change in conditions. The large furnace of the Woodward Company is about completed and until it is tested there will be no information given out concerning its workings.

The situation concerning Coke and Coal is unchanged. The price generally asked for good quality Coke is \$3.75, but there are circumstances under which \$3.50 has been accepted, and in one case contracts are yet incomplete at \$3.25. The market this week is reported as quiet and steady. Foundry Coke is \$4, possibly a little less. Coal is just as has been stated about Coke. Run of the mines is still quoted at \$1.25 to \$1.35, with some seams having special value.

There have been some changes in the quotations of Scrap Iron and those herewith presented are based on actual transactions and are correct: Stove Plate, \$9; Heavy Cast Scrap, \$11.25; Old Iron Rails, \$17; Old Steel Rails, \$13; Heavy Steel Scrap, \$14.50; Iron Car Axles, \$19; Steel Car Axles, \$15; Old Car Wheels, \$15.50; Light Relaying Rails, \$23; Railroad Wrought, \$16.50.

The Dimmick Pipe Company reports rather a quiet business at unchanged values and still quotes \$24 for 4 and 6 inch sizes and on the basis of \$23 for the other and larger sizes. There is no new business offering of moment.

The bank clearings for the year ending April 30 show an increase over the preceding year of about 8 per cent.

The Renfro Car Replacer Company, capitalized at \$75,000, was incorporated the past week by J. L. Renfro and associates, and John Sweet was made president; J. L. Renfro, vice-president, and J. A. W. Smith, secretary-treasurer.

Everything so far bears out what these letters have stated concerning the future outlook. We are not forging ahead as fast as we might and would if we only had the labor on hand to carry out with promptitude the many enterprises planned, but which are delayed on this account.

### New York Pig Iron Warrant Market.

NEW YORK, May 17, 1905.

The demand for pig iron warrant certificates on the New York Produce Exchange continues fairly good, with sales of 1100 tons the past week. Of this amount 400 tons foundry were sold; October, 100 tons, \$15.90; 100 tons, \$16; June, 100 tons, \$15.60; July, 100 tons, \$15.75. The remaining transactions were all for regular certificates and included May, 100 tons, \$15.40; 100 tons, \$15.50, and 100 tons, \$15.70; June, 100 tons, \$15.60; 100 tons, \$15.65; July, 100 tons, \$15.50, and 100 tons, \$15.65.

The following quotations were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash .....				
May .....	\$15.30	\$15.60	\$15.50	\$16.00
June .....	15.30	15.70	15.50	16.00
July .....	15.50	15.70	15.80	16.00
August .....	15.40	15.80	.....	.....
October .....	15.40	15.50	15.85	16.25
November .....	15.40	15.50	.....	.....
December .....	15.40	15.50	.....	.....
February .....	15.40	15.50	15.60	16.00

The International Railway Boiler Makers' Association is holding its fifth annual convention in Buffalo this week, opening on the 16th inst.

### William G. Mather Addresses Michigan Students.

At the annual class day of the Michigan School of Mines, held last week at Houghton, Mich., the address of the occasion was given by William G. Mather, president of the Cleveland Cliffs Iron Company, one of the great and growing forces of the West, a leader in independent mining, in forestry, in railroading, in iron making, in all that goes to make thorough and well rounded enterprises, and, on the more altruistic side, of the paternal care and thought for its employees. Mr. Mather spoke in part as follows:

We are naturally partners, one with each other. My institution was founded in 1850, yours in 1886. As my company shipped the first iron ore through the Sault Canal, whose semicentennial is to be celebrated this year, our activities preceded yours by 36 years. We feel that we accomplished much in those years, in spite of the fact that we had not the benefit of the trained engineer. We are not to forget, and especially to-night, that the path of the engineer was prepared beforehand by the hardy and intelligent pioneers and practical miners who opened and developed the great iron and copper mines of Lake Superior. Even the geologist owes them a debt, and he is greatly helped and informed by the adventurous practical miner who frequently ventures into places where the geologist—not fears—but sometimes thinks it unnecessary to tread. Never, therefore, fall into the foolish error of undervaluing the work of the miner, who, though not trained in a technical school, may have been so studied in the practical classes of life as to be superior to those who emerge from scholastic halls.

#### Increase of Technical Men in Places of Trust.

In 1886, when this school was founded by the State of Michigan, six leading mines in this State employed 6, and in 1904, 29 technically trained men. In 1887-8 this college graduated 7 men, and in 1904-5 it sends out 46, and its graduates are scattered over the world, in 39 States and in Cuba, Newfoundland, France, Japan, Mexico, Peru, Nicaragua, Russia, South Africa and the Yukon. The changes in the position of the Lake Superior country and the United States in these 18 years cannot be appreciated without a grouping of figures, but these are long and you are doubtless familiar with them. I refer to these things to emphasize the changes and progress of your chosen industry during the few years marking the life of this college. I am told there is annually more of a call for mining engineers than the schools can furnish; this demand arises, and will continue, not only from the increase of mines, which it is my firm belief will be rapidly added to throughout all the world except in the few parts where mining cannot be carried on, but also from the tendency of mining companies to put technical men in places of trust that have been filled by men of practical training only. You young men, with that native modesty and self abnegation so notable in the graduate, may scarcely believe there is a place for all, but I have traveled 800 miles to reassure you on this point. There is always room at the top, and it is all top for you just now.

Then let us rejoice in the greater regard for the engineer's status in the professional world. It is not long since that the academic student was looked upon as a being superior to the engineer, and the "B. A." was much more sought than the "B. S." or the "M. E." This point of view has deterred young Englishmen in particular from entering these professions, and for this reason, no doubt, in part, the whole of the gold mining industry, of which England holds mines producing 75 per cent., is in the hands of American engineers. Professor Christy of the University of California calculates the value produced by all engaged in the mining industry as \$981 per capita. Per miner engaged, the amount was \$2900 per capita; per administrative officer \$23,020 and per engineer \$97,872. If each captain of the mining industry actually superintends the production of approximately \$100,000 per year, is it not important that he be thoroughly trained and that into his training shall go all that modern science can give to make it efficient? The

crops the miner takes can be harvested but once, and anything left is lost. It is plain, therefore, why a large mining company can afford to pay experienced mining engineers the very large salaries they sometimes receive, and it is for the same reason a profession where inefficiency or weakness of mind or character is a signal disqualification.

#### Mining Engineering Requires a Broader Training

than any other branch; it must embrace mechanical, civil and electrical engineering as well as applied chemistry and mineralogy. There is no longer any question as to the advantage of technical training. If you do not outstrip the practical miner it will be because you have not taken advantage of your training here. I congratulate you upon having chosen this honorable, interesting and lucrative profession and upon being graduated from this fine institution, directed by so learned a faculty and a president so honored and able as Doctor McNair.

You have just begun your course. Your alma mater is but 18 years old. When you have been 18 years in harness you will still be young men; at least so it seems to us who have passed that point. To you now it may appear that 18 years hence you will be beyond the stage of usefulness. Do not set your hearts, therefore, on immediately assuming positions of responsibility. You are deficient in three things: first, the art of mining—that is, the knowledge of those practical details of things mineralogical that must be learned underground; second, business experience; third, the art of bossing men. What better way of learning these things than by spending a certain time underground, doing a miner's work, equipping yourself to know what is the daily capacity of a man and a drill in any kind of ground and not to be deceived by systematic efforts to "soldier"; to appreciate by actual experience with miners and laborers what kind of supervision, of contracts and wages are best to stimulate the men to their best when hid away from the manager's sight; to know from the same hard school just how supplies are wasted, how mistakes are covered up by the engineers, the timekeepers, the mechanics; how the employer is cheated in numberless small, sometimes larger, ways; how the men are cheated and troubled until at length there is a strike, a cave-in or a death? A year or more after graduation spent in this way will, in my opinion, be the best preparation for the future that any mining graduate can secure. At the end of ten years of active work you will recognize this year or two as the most valuable you have put in. But few men have the courage to resist the temptation of high pay and position and to take their place in this system of apprenticeship. Repress that common failing of the graduate, his abounding self confidence and his pity for the methods of the "old man," his manager; consider what you can learn from contact with such men, who, without your advantages, have become a Joseph Sellwood, a D. H. Bacon, a T. F. Cole, a Thomas Walter, a John Duncan, a W. E. Parnall, a Samuel Mitchell or a W. F. Fitch—all leaders of their profession and men of great minds and high ability. Consider, too, what you will receive in knowledge of human nature and conditions from contact with those hardy sons of toil whose wages constitute 70 per cent. of mining costs and whose habits and characteristics you ought to know.

#### Necessity for Hard Work.

Do not fail to appreciate the opportunities of your life work. "Ambition, aptitude, preparation and hard work" are the stepping stones to successful attainment. Avoid the mediocrity of compromise; be thorough and stand for full competence in everything. I cannot too greatly impress upon you the importance of that little word "work," especially when directed by such thorough training as you have received. It is work—the capacity for it and the enjoyment of it—that has pushed forward the industrial progress of the United States and that is with still more notable progress raising Germany to the forefront of industrial nations, in spite of her comparatively mediocre opportunities.

We can never know everything even of our own business. Perhaps some humble miner, or a neighbor with a less important property than our own, may, if he has

an opportunity, give us useful aid. Let us be receptive and willing to receive advice and information from any source. Be willing to learn and do not rely too implicitly on the past and its training. In the pride of our country and its advances, its resources, let us not be too overconfident. Let us see what others are doing, especially that marvelous German nation, which is now so wonderfully advancing along the lines of trained progress.

Let me say a few words as to your duties in life: First, as to your employer, an honest day's work, loyalty and rectitude; for you know his secrets as no one else can. Then, to your subordinates, you should display firmness tempered with justice and consideration and give careful attention to such details as their health and comforts. I call your attention to the fact that in the past 17 years there have been 1600 fatal accidents in the mines of northern Michigan, an average of 5.08 in the iron mines and of 2.98 in the copper mines per 1000 men working. You have no right to be unmindful of these things either morally or from a material standpoint. Then to society: The mining engineer goes out to all rougher parts of the earth. Let his education as a scholar and a gentleman be a shining mark and a credit to his college and his native land. Your State has given you your education; you have a duty to return to it your aid in uplifting its people morally and materially. The cause of good government is your own. The schools, the municipalities in which you are, the public morals, the private cleanliness, all are your care to a certain extent. Then to yourself—remember the words of Polonius: "To your own self be true." And then to your alma mater: You do not want, you cannot afford, to stand below the mark her sons have already set; keep in the class established by the graduates of your own and other schools throughout this land.

#### Late Pittsburgh Notes.

PITTSBURGH, PA., May 17, 1905.—(By Telegraph.)—The sheet mills of the Whitaker-Glessner Company, at Wheeling, W. Va., affected by the strike, have been shut down in all departments for an indefinite period and the nonunion men discharged. Several attempts have been made by the Amalgamated Association officials and also by the Mayor of Wheeling to settle this strike, but without avail. The sheet plant at Martins Ferry, Ohio, owned by the Whitaker-Glessner Company is also idle.

The Pittsburgh Bridge & Iron Works has started to build a new plant at North Rochester, Pa., about 25 miles from Pittsburgh. The main building will be 93 x 106 feet. The company now operates a small plant in Pittsburgh, which will be removed to North Rochester as soon as the new plant is completed.

The Morgan Construction Company and the Morgan Spring Company, Worcester, Mass., have made an offer to purchase the idle plant of the Youngstown Bolt Company, Youngstown, Ohio. Should the deal be made the purchasers will build a large addition to the present works and take up new lines of products.

The decision of the Supreme Court of the United States that no tax on coal mined in Pennsylvania and shipped out of the State to be deposited on docks or in warehouses can be collected is of much importance to Pittsburgh coal interests. It was considered a test case.

The National Protective Association of Tin Plate Workers, composed of tin house labor, in session at Wheeling, W. Va., for a week, will conclude its meetings in a few days. The new scale for tin house labor has been made up and asks for higher rates than in the present scale, which expires June 30.

A receiver has been appointed for the Columbia Drilling & Mfg. Company, Pittsburgh, whose plant is at New Kensington, Pa. The assets are given at \$90,000 and the liabilities \$53,000. D. B. Doty of New Kensington was appointed receiver.

Frank J. Hearne, president of the Colorado Fuel & Iron Company, is a visitor in Pittsburgh this week, looking after private interests. Mr. Hearne speaks very enthusiastically of the general outlook for the iron trade.

The recent issue of \$2,500,000 in bonds by the Youngstown Sheet & Tube Company to cover the cost of build-



ing its new Bessemer steel plant at Youngstown, Ohio, was oversubscribed by \$800,000. All the bonds were subscribed for by present stockholders of the company, none going to the underwriters.

## New York.

NEW YORK, May 17, 1905.

**Pig Iron.**—Sales and inquiries in this district have been on so limited a scale that the market has not been seriously tested. The majority of the Northern furnace companies have their order books in such good shape that they are not urgent sellers. In the New England district Buffalo Irons are again being offered at prices which are considerably below the parity of Lehigh and Schuylkill Valley asking prices. It looks, therefore, as though the latter will lose some ground in that district. We quote as follows: Northern No. 1, at tide-water, \$17.50 to \$18; No. 2 Foundry, \$17 to \$17.25; No. 2 Plain, \$16.50 to \$17, and Gray Forge, \$15.25 to \$15.50. Alabama and Tennessee Irons are on the basis of \$16.75 to \$17 for No. 2 Foundry.

**Steel Rails.**—Aside from the sale of a lot of 14,000 tons to the Havana Street Railroad, in Cuba, no transactions of any consequence are reported.

**Cast Iron Pipe.**—While the Eastern foundries are still very busy, manufacturers report a tendency toward lighter purchases. They are in receipt of a fair run of orders, but at present nothing large is coming out. No public lettings have recently occurred to fix prices on large lots. If a buyer should enter the market for any considerable quantity of large sized Pipe it is likely that the competition for such business would be quite sharp, as the demand for some time has been running mainly on the small sizes. Carload lots continue to be quoted at \$28 per net ton for 6-inch, at tide-water, but larger lots would take somewhat lower figures.

**Finished Iron and Steel.**—The American Bridge Company entered orders during the past week for about 12,000 tons of structural work, consisting of both bridges and buildings, but not including any single job of magnitude. The railroad companies are still coming into the market for nearby requirements, and the building trade is steadily developing more projects. Quite a good number of important buildings are now in prospect in this vicinity. The first two weeks of this month ran ahead of normal bookings in the Structural line, and the month will undoubtedly make a still better showing than did April, while every expectation is entertained that June will prove to be fully as good as May. Bids are now in, as stated last week, for the first portion of the structural work on the new Pennsylvania Railroad station in this city. This portion of the work will take about 21,000 tons and will only bring the structure up to the street level. It is estimated that on this basis over 50,000 tons will be required for the entire building. The Philadelphia Rapid Transit work, to which reference was also made last week, will take something over 20,000 tons, and is believed to have been virtually closed, although official announcement has not yet been made. Business in other lines of Finished Iron and Steel has been only of moderate proportions. Premiums are no longer being asked on Plates, although the mills are still well provided with work and are not anxious for new business. Quotations at tide-water are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04½c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.74½c. to 1.84½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

**Old Material.**—Dealers report conditions very quiet in practically every branch of this trade. Consumers of Old Steel Rails for rerolling are so well supplied at present that they are making very low offers on lots which are being pressed for sale. Almost nothing is doing in Wrought Scrap or rolling mill stock. While the market is stagnant at present, dealers are not disposed to sacrifice such material as they have on hand, believing that at a reasonably early date they will find a decided revival in the demand, which will bring about better prices. Quotations per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails.....	\$20.00 to \$21.00
Old Steel Rails, rerolling lengths.....	14.50 to 15.00
Old Steel Rails, short pieces.....	14.00 to 14.50
Relaying Rails.....	20.00 to 21.00
Old Car Wheels.....	15.00 to 16.00
Old Iron Car Axles.....	21.00 to 22.00
Old Steel Car Axles.....	17.50 to 18.50
Heavy Melting Steel Scrap.....	14.00 to 14.50
No. 1 Railroad Wrought Scrap.....	18.00 to 19.00
No. 1 Yard Wrought Scrap.....	16.00 to 17.00
Iron Trunk Scrap.....	15.50 to 16.00
Wrought Pipe.....	12.50 to 13.50
Ordinary Light Iron.....	9.00 to 9.50
Cast Borings.....	7.50 to 8.00
Wrought Borings.....	11.00 to 11.50
No. 1 Machinery Cast.....	14.50 to 15.00
Stove Plate.....	12.00 to 12.50

## Metal Market.

NEW YORK, May 17, 1905.

**Pig Tin.**—During the latter part of last week business was fairly active, and sales were made at prices varying from 30c. to 30.10c., but on Monday and Tuesday of this week the activity ceased, and business dwindled to small proportions, notwithstanding the fact that prices were easier. Although several good sized shipments arrived during the last week the total arrivals for the month amount to but 1565 tons, which is less than the calculated consumption for this period. The stocks afloat are also small in comparison, amounting to 1610 tons, which leaves the amount of metal in New York small, but all the metal here is in firm hands. The New York Metal Exchange reports that shipments from the Straits for the first half of May to the United States and Europe amounted to 2305 tons, as against 2565 tons during the corresponding period last year. Today's closing quotations are 29.75c. to 30.15c. for spot, while sellers are generally holding the metal at 30c. Future deliveries for May are held at 29.50c. to 30c., for June at 29.37½c. to 29.75c., and for July at 29.25c. to 29.62½c. In London prices have declined to £135 10s. for spot and £134 10s. for futures.

**Copper.**—An active market during the week resulted in cleaning up a considerable amount of Spot Copper at 15c., and some sales were made at 15.12½c., but this price was obtained for prompt shipment, and the price generally asked for Lake and Electrolytic is 15c., while Casting grades are firmly held at 14.75c. The brass manufacturers have been very active buyers lately and there is very little Copper to be had for June or the first half of July delivery. The large production and entire absence of any accumulation, together with the continued heavy takings of both European and Chinese consumers, keep the statistical position of this metal very strong. The Chinese consumers are again sounding the market relative to purchases of about 8000 tons for delivery in July, August and September; a large consumer has also purchased freely for those months. In London the prices are quoted at £64 7s. 6d. for spot, £64 7s. 6d. for futures and £69 15s. for Best Selected. The shipments so far this month aggregate 12,578 tons, of which 4500 tons go to the Orient.

**Spelter.**—Prices continue to decline on little or no demand and to-day's quotations are 5.50c. to 5.60c. for spot and May, while the June delivery can be obtained at 4.50c. In St. Louis a similar decline has been experienced and prices are now held there at 5.30c. The price of Ore has also declined and is now held at a \$42 basis. In London today's closing cables are £23 12s. 6d.

**Pig Lead.**—Although prices are unchanged at 4.50c. to 4.60c., the market is not quite as firm. The American Smelting & Refining Company continues to quote shipment Lead in 50-ton lots at 4.50c. In St. Louis prices have declined to 4.45c., while in London closing quotations are £12 18s. 9d.

**Sheet Zinc.**—The leading producer of Sheet Zinc reduced the base price to \$7.25, f.o.b. mill, subject to the usual discount for cash and quantity. At the new price the demand is not active.

**Antimony.**—This metal is very scarce, all grades being held at 8.75c. to 9c.

**Quicksilver.**—The market is practically unchanged, flasks of 75 lbs. being quoted at \$38. The London market is quoted at £7 7s. 6d.

**Nickel.**—The tone of the market is quiet. Prices are practically unchanged, large lots being quoted at 40c. to 45c., and smaller quantities at 50c. to 60c.

**Tin Plate.**—Although there is some accumulation of Plates at the mills prices remain firm, and there is no evidence of concessions. The American Sheet & Tin Plate Company continues to quote \$3.74 a box for 14 x 20, 100-lb. Coke Plates, f.o.b. New York, or \$3.55, f.o.b. Pittsburgh. Plates are lower in Swansea, being quoted at 1½ shillings 7½ pence.

Through the courtesy of L. Vogelstein, the American representative of Aron Hirsch & Sohn, Halberstadt, Germany, we give the following figures of the German consumption of foreign Copper for the months January to March, 1905, compared with the same period of time for 1904 and 1903:

	1905. Tons.	1904. Tons.	1903. Tons.
Imports.....	24,668	29,624	19,590
Exports.....	3,173	1,958	2,942
Consumption.....	21,495	27,666	16,648

Out of the above 20,255 tons were imported from the United States.

## The Machinery Trade.

NEW YORK, May 17, 1905.

With very few exceptions both machinery dealers and manufacturers are doing a fairly good business. It is the general opinion that trade is close to the very good mark and that it will only take a few large transactions to produce a more than normal business; in fact, one concern recently reported its largest month, the effect of the receipt of one fairly large order. This is the condition prevailing with a majority of the houses, the heads of which are very sanguine regarding the near future. There is considerable talk in the trade as to the prospects for early closing of the various railroad lists recently sent out. It seems that the New York Central list was sent to only a few, while a much greater number are bidding on that of the Norfolk & Western Railroad. Both of these lists are expected to be provided for within the next few weeks. With manufacturers of power plant equipment business has increased to a marked degree within the past few weeks.

Boiler and engine men are in a pleasant frame of mind over present business conditions, and it is apparent that their products are more in demand than the average machinery line. While there is nothing especially big in the market to claim their attention they are doing an excellent running trade of ordinary orders, and the number of inquiries in the market gives them assurance that business will continue good. Those who are familiar with trade conditions in the boiler and engine markets say that the satisfying conditions now in existence are accounted for by the fact that there is considerable construction work going on and there are calls in the market for boilers and engines from firms that are making purchases in only those lines. Boilers are being purchased for heating purposes and engines for power in office buildings and other structures of the kind, and it is on that account that while the machinery trade may not be exactly booming, the boiler and engine trade is in what might be called more than an encouraging condition. The outlook for the future is also gratifying and men in the trade are looking forward to a good summer business.

In connection with the above it will be interesting to note the numerous power and lighting companies organized last week, some of them with an authorized capital stock running up into the millions. The following are the new corporations: Electric Power & Transmission Company, Niagara County, N. Y., capital \$5,000,000; Oswego River Power Transmission Company, Syracuse, N. Y., capital \$20,000; Aqua Light & Power Company, New York, capital \$100,000; Troy Public Service Company, Troy, N. Y., capital \$100,000; Nassau & Suffolk Lighting Company, Hempstead, N. Y., capital \$200,000; Overland Power Company, Syracuse, N. Y., capital \$20,000; General Public Service Corporation, New York, capital \$2,000,000; Universal Service Company, New York, capital \$100,000; Hanover Light & Power Company, Albany, N. Y., capital \$2,000,000; Inter-Insular Heat, Light & Power Company, New York, capital \$500,000; International Power & Transmission Company, Niagara County, N. Y., capital \$2,000,000. It is understood that these companies were incorporated at this time to escape the provision of the Public Service Commission bill, which is expected to become a law in a few days.

### Public Service Corporation New Shops.

Plans are being perfected by the Public Service Corporation of New Jersey for a large car building and repair plant to be erected at Newark, N. J., where the Plank Road car barns and repair shops are now located. General Manager Stanley of the company has the matter in charge and it is proposed to erect a plant large enough to do all the car repair work on the company's entire system, which includes all the trolley lines of any consequence in northern New Jersey. The various subsidiary companies which the Public Service Corporation controls now have car repair shops of their own and they are scattered throughout the State as far south as Trenton. When the new plant is completed all the shops will be merged into one, and only the simple repairs will be done at the smaller shops. While it is the purpose of the corporation to establish principally a repair plant, it is intended also to manufacture some cars in the new shops, but not on a particularly large scale at first. The plans, which will be completed within a week, call for a repair shop about 140 x 335 feet, a machine shop, 120 x 390 feet, and a paint shop, 195 x 354 feet. The plant will include wood working and car finishing departments. It is the purpose of the company to rush work on the structures and if possible they are to be completed by next fall. It is said that the plant will be one of the most complete trolley repair and manufacturing plants in the country, and the cost, which has not been announced, will reach a large figure. It is purposed to have all of the shops connected so that cars in course of construction or undergoing repairs can be placed on a platform running on tracks and moved from one department to another without difficulty. While the company will move some machinery from its various shops to its new plant when the latter is completed, the machinery it now owns will be by no means

adequate for its needs and a large amount of new machinery will be purchased. None of the machinery has been arranged for as yet, and the announcement that the company is going to construct such a plant is one of considerable importance to the machinery trade, as a complete machine shop equipment will be needed in addition to all sorts of wood working machinery, besides electric motors of no small number, as it is the purpose of the company to drive all of its machinery by electric motors, with power furnished by its own power house, now in course of construction not far from the site of the proposed repair plant. Mr. Stanley has offices in the company's building on Exchange place, Jersey City, adjoining the Pennsylvania Railroad station.

### Another Pennsylvania Railroad List.

The new shops near Harrisburg, for which prices have just been obtained by the purchasing agent of the Pennsylvania Railroad Company, will be equipped with tools which will cost approximately the sum of \$600,000. The inquiries for this lot have not yet been sent out by the purchasing agent, but it is likely that they will be reached within the near future. As a matter of fact, the motive power department has not yet compiled this list, but is now working upon it. Meanwhile, however, the following list of tools is required for different points upon the Pennsylvania system: Machine for grinding triple valve piston rings, shearing attachment for trimming and splitting plates, one ton hoist, to be fitted with traveling motor; one 10-ton capacity iron pillar crane, 16 foot 6 inch radius; one portable cylinder boring bar and fixtures, one No. 1 tool grinder, one 32-inch special railroad shaper for shaping driving boxes, two two-stage air cross compound steam air compressors, to operate noncondensing on 125 pounds boiler pressure; one 250-pound post hammer, to be operated by steam; one 90-inch boring and turning mill, fitted with two heads; one 1½-inch automatic turret lathe, complete; one 3200-pound single frame hammer, with 50-inch stroke; one 2-inch vertical hollow chisel mortiser, with boring attachment; one band saw for wood work, one 400-pound single frame steam hammer, with treadle attachment; one 2000-pound cross head single frame steam hammer; one No. 7 combined punch and shear, with 18-inch throat; one 2-inch bolt shears, motor driven; four vertical boring mills, fitted for boring locomotive driving boxes; one direct acting plunger elevator.

At Trenton, N. J., the Pennsylvania Company intends to build several additional shops, including a boiler and tank shop, 163 x 190 feet, of brick and steel; flue cleaner building, 10 x 26 feet; lye house, 20 x 30 feet; casting storehouse, 41 x 116 feet, and several smaller buildings. At its Juniata shops the company is to build two electric locomotives of large size, to be used on the New York & Long Island Railroad. These locomotives will be of different design from those recently ordered from the General Electric Company by the New York Central Railroad. One will be operated by direct current and the other by single phase induction motors.

A number of orders have recently been placed by Westinghouse, Church, Kerr & Co., 8 Bridge street, New York, for the equipment of the Long Island City power station of the Pennsylvania Railroad. Orders for a complete pumping outfit, including 15 large compound pumps, two large fire pumps and several auxiliary pumps, were secured by Chas. T. Henry, 141 Broadway. The machinery for the Long Island Railroad Company's machine shop at Woodhaven Junction, the purchasing of which is in the hands of Westinghouse, Church, Kerr & Co., has been arranged for and most of it has been ordered for delivery in the near future.

The Brooklyn Rapid Transit Company is now placing additional orders for machinery for its new Kent avenue power station. Among the orders given was one for an air compressor and five pumps, awarded to Charles T. Henry, 141 Broadway, New York.

### Important Machinery Requirements.

There are several inquiries for electric traveling cranes of various sizes in the market just now and before long some nice orders will be placed in that line. The Eastern Steel Company, Pottsville, Pa., is asking for bids on two 20-ton cranes, one special 10-ton crane, ten 5-ton cranes and 12 3-ton cranes. The New York Central Railroad Company is asking bids on a 100-ton traveling crane, to be used in connection with the improvements to be made at its Depew shops, and the New York Edison Company, 55 Duane street, is asking bids on four 20-ton cranes, to be distributed among some of its substations.

A 2500-barrel cement plant will be erected during the summer at Patternburg, N. J., by the Ajax Portland Cement Company, which is now in the market for a large amount of machinery for equipping the plant. George D. Claffin, Jr., 39 Cortlandt street, has charge of the equipment of the plant, which will be one of the largest and most complete of its kind in the country. The plans include a main building, 140 x 320 feet, besides a grinding room, 48 x 100 feet; boiler house, 50 x 60 feet, and an engine room, 80 x 100 feet. Steam power will probably be used and a power plant of 2400 horse-power will be installed. The machinery required includes stone crushers, cement grinders, clinker burners, coal grinding machinery, pecking machinery and



elevating and conveying machinery, besides the engines, boilers and other power machinery. It is expected that the plant will be in operation by next fall. The incorporators of the company are Hiram C. Bennett, Edward H. Bennett and H. B. Starrett, all connected with H. C. Bennett & Co., 18 Wall street. H. C. Bennett is president of the company, Isaac S. Metter of 66 Broadway is vice-president and E. H. Bennett is treasurer. The directors are the officers mentioned and Chester Thompson, George H. Large, John Lewis Childs, Jacob Welsh, Robert A. Montgomery, Lewis Parker and Elmer Thompson.

The Susquehanna Coal Company is in the market for a complete coal breaker, to be installed at Centralia, Pa. In addition to the breaker machinery the company will require power and other machinery. The purchasing is being done by C. Bowman Dougherty, who is at the main offices at Susquehanna, Pa.

Among the mining schemes which are attracting attention are the new enterprises of the American Smelter Securities Company, 71 Broadway, and the Greene Gold-Silver Company, 24 Broad street, New York. An announcement which has been made of the former company's plans show that extensive additions to its smelting properties are to be made during the coming summer. The expenditures will amount to more than \$5,000,000. Funds have been provided for a copper smelter near Salt Lake, Utah, and the plant there has been begun, but \$3,000,000 is still to be spent in completing it and to supply a sufficient working capital. In addition to the Utah smelter the company will construct a lead and copper smelter in the State of Durango, Mexico, to be operated in connection with the extensive mining system there. The company is also contemplating a copper smelting plant in California, to cost \$2,500,000. The plans are now being prepared by the engineering force. The development of mining properties in Northern Mexico have been given considerable attention by the American Smelters Securities Company. The plans have been prepared for lead and copper smelters at Chihuahua, Mexico. The construction of these smelters, besides additions to several of the other of the company's large plants, will entail the purchase of a large amount of power machinery during the summer. Although many large orders have already been placed, the buying has by no means been completed. The purchases will be made through the company's New York office. The American Smelters Securities Company has a capital of \$77,000,000, divided into \$17,000,000 of preferred stock, series A, 6 per cent.; \$30,000,000 of preferred stock, guaranteed 5 per cent., and \$30,000,000 common stock. The company is managed and controlled by the American Smelting & Refining Company, and the officers of the two concerns are almost identical.

The Greene Gold-Silver Company is planning to develop the extensive gold and copper properties recently acquired by it in the vicinity of Mulatos, Mexico. Col. W. C. Greene recently secured a concession from the Mexican Government, giving his company the exclusive right to mining properties upon 4000 square miles in that vicinity. The company is building a new mill at Ocampo and two smelters of 250 tons capacity each to be erected upon the Guaynopita property. It is also preparing to erect a 2500-ton plant at the Mulatos mines, and power will be furnished by the installing of a large electric plant on the Aros River nearby. Colonel Greene is now in Mexico, and he will remain there for some time, looking over the property and deciding upon what further improvements are to be made. While some machinery has been purchased for these improvements, the company intends to buy considerable mining and power machinery in addition to electrical equipment for its power station during the summer. Frank Klepetko, who is consulting engineer of the Greene Gold Company, is preparing the specifications for the plants to be constructed. Mr. Klepetko has offices at 24 State street, New York.

The Standard Milling Company, 69 Wall street, has purchased land at Armourdale, Kan., for the erection of a large flouring mill. It is proposed to build a mill to produce 2000 barrels of flour daily, and the company will probably erect a fire proof elevator to be conducted in connection with the mill. Plans for the structures have not yet been completed, and the details will probably be attended to from the Kansas City office.

The development of the sugar industry in the vicinity of Humacao and Esperanza is being undertaken by the Esperanza Central Sugar Company and the Humacao Sugar Company, two closely allied corporations. The Porto Rico Engineering Company, 78 Wall street, has been awarded contracts for constructing plants for both companies. The Humacao Company's plant is already in course of construction. W. A. Cullen of the Porto Rico Engineering Company is now in Porto Rico superintending the erection of the plant, which is to be a sugar mill capable of handling 1000 tons of cane a day. All the machinery for the Humacao plant has been purchased, but nothing has been bought as yet for the Esperanza Company, and the concern will shortly be in the market for machinery. The plant will consume 750 tons of cane a day at first. The machinery needed will include a power plant, crushers, quadruple effects and other

sugar refining machinery. A steel building will also be put up. C. J. Field of the Porto Rico Engineering Company, who has just returned from Porto Rico, states that the plant will probably be erected next fall.

#### Power Work.

The T. A. Gillespie Company, 71 Broadway, New York, has awarded a number of subcontracts for machinery to be used in the filtration plant at Pittsburgh. Among them was one for three horizontal direct acting triple expansion pumping engines, two of which will be of 5,000,000 gallons capacity and the other of 3,000,000 gallons capacity per day.

The Pelton Water Wheel Company, 143 Liberty street, New York, has been awarded a contract by the Animas Canal Reservoir Water Power & Investment Company, Durango, Col., for two 400 horse-power water turbines to operate under 1000 feet head, each direct connected to a 2250-kw. General Electric generator. The contract also includes a pipe system consisting of 2800 feet of piping ranging from 34 to 44 inches in diameter. The Dalton Power Company, Dalton, Mass., has given an order to the Pelton Water Wheel Company for two 800 horse-power turbines, to be operated under 160 feet head, direct connected to generators, which have not been purchased as yet. The machinery will be used for power and lighting service, and the order includes 7000 feet of piping 48 inches in diameter.

Sanderson & Porter, 52 William street, New York, will install in the central power station in course of construction for the New Orleans Railroad Company three 1500-kw. turbine units.

A Machinery Committee has been appointed by the Executive Committee of the National Supply & Machinery Dealers' Association. This committee is composed of the following gentlemen: F. H. Brown of Brown & Zortman Machinery Company, Pittsburgh, Pa.; A. J. Babcock of Manning, Maxwell & Moore, New York, and H. Prentiss of the Prentiss Tool & Supply Company, New York. J. H. Drury, who, as we have previously noted, has been appointed secretary-treasurer, has opened offices at 69-71 Frankfort street, Cleveland, Ohio.

### New England Machinery Market.

WORCESTER, MASS., May 16, 1905.

A radical departure in the design of a machine tool has a stimulating effect upon the development of its particular line. Two such instances have occurred in New England during the past year, and the results upon the general types of machines are awaited with a good deal of interest in the trade. The Chandler planer, built by the Chandler Planer Company, Ayer, Mass., and the sensitive drill press manufactured by the Henry & Wright Mfg. Company, Hartford, Conn., are the two machines in question. The Chandler planer has remarkably rapid return as well as high cutting speeds and interesting variable speed mechanism. The direct result has been that other planer builders have been experimenting and redesigning their tools, and important announcements may be expected as an outcome of this work within a few months, possibly within a few weeks. Controversy has arisen as to what is the best practice in the matter of cutting speeds and rate of return of table. Scientifically accurate tests have been made and more work of the sort is contemplated. A great saving of time and corresponding increase in the efficiency of a planer are effected by cutting down the time of the return. In the matter of cutting speeds much depends upon the amount of power and, according to the contention of the Chandler people, upon the amount of energy that may be saved in the machine by reducing friction to a minimum by the use of ground bearings throughout.

The same interesting condition exists with the sensitive drill press. The Henry & Wright drill contains radical changes in practice, in that it drives the drill at an exceedingly high rate of speed, exceeding 2000 revolutions on smaller sizes of drill. The details of the machine have been printed with illustrations in *The Iron Age*. Other manufacturers of drill presses have been at work along the same general lines with interesting results. One is that much greater efficiency can be obtained from the ordinary drill press by speeding it up. There are those that believe that it will prove to be better practice to run a drill at a somewhat lower speed, but with greater feed. At 2000 revolutions the feed per revolution is necessarily very small, but the aggregate per minute is large. The question of friction also appears in the drill press, the machine in question having ball bearings to take up much of the friction, coupled with other devices. Within the next year other new drill presses will be on the market, built along lines induced by different theories, and important comparisons will be possible which will tend to settle some of the questions which have been raised by the introduction of twist drills of high speed steels. Machine tool men and users of planers and

sensitive drills are finding the questions worthy of a good deal of discussion among themselves.

The condition of the machinery market in New England has changed but little during the past week. The demand is good, but not steady.

The Palmer Mountain Tunnel & Power Company has been organized by residents of Holyoke and Springfield, Mass., and neighboring places, to develop mining properties on Palmer Mountain, State of Washington. The company has an authorized capital stock of \$5,000,000. The officers are: President, John Tilley, Holyoke; first vice-president, F. G. Burnham, Holyoke; second vice-president, E. E. Barr, Springfield; secretary, L. H. Porter, Northampton; treasurer, Samuel Porter, Florence; general manager, John Boyd, Loomis, Wash. The company has placed contracts for electrical machinery to develop 3000 horse-power in four units of 750 horse-power each. It is still in the market for a crusher of 300 tons capacity and other mill machinery.

Haverhill, Mass., is another city that is preparing a ready made home for new industries in the form of a general manufacturing building that will provide power for its tenants. The Haverhill Building Association has been organized for this purpose and the local Board of Trade is co-operating with the trustees in the work. An option has been secured on 50,000 square feet of land and it is expected that an eight-story factory building, 50 x 200 feet, will be erected on the premises this season, and provision will be made for two other similar buildings for the future. The buildings will be of mill construction, with all modern improvements to make easy the handling of goods and materials and to reduce the cost of insurance. Freight and passenger elevators will be installed.

The business of Pickett & Dickinson, manufacturers of box cornering machines, Baldwinville, Mass., has been purchased by Napoleon Alzinger and J. H. Pickett, Gardner, Mass., who will establish a shop at 53 Main street, Gardner. Mr. Pickett is the inventor of this machinery. No new machine tools will be required at present.

The Warren Steam Pump Company, Warren, Mass., has opened a New York office at 95 Liberty street. W. D. Kearfott will be in charge as the company's agent. Mr. Kearfott has had a long experience in the pump business, having been connected with the International Steam Pump Company and the companies now associated with it for the past 20 years.

The Fall River Electric Lighting Company, Fall River, Mass., is to make a large addition to its generating capacity as soon as the necessary permission has been obtained from the State Gas and Electric Light Commission to increase the company's capital stock from \$350,000 to \$600,000. Engines and generators to supply 2000 kw. will be installed on the company's wharf at the foot of Hathaway street.

The Arlington Mills, Lawrence, Mass., are planning one of the most comprehensive schemes of improvement ever carried out in the textile manufacturing industry of New England. It is stated that these improvements will cost close to \$2,000,000. One 3000 horse-power steam turbine will be installed at once in the new power house, which will be large enough to receive two other 3000 horse-power units later on. The boiler capacity of the power house and the electric generating equipment will be correspondingly large. The mill plans as given out include a weave shed, 205 x 604 feet; dyeing and finishing plant, 100 x 375 feet and four stories, and a two-story brick mill, 337 feet long, with a wing 277 feet long. The dyehouse proper will be 200 x 360 feet. The power house will be 200 x 360 feet. These figures are not official, but in a general way give the dimensions of the great plant.

The Winsted Edge Tool Works, Winsted, Conn., is to build a substantial addition to its hammer shop, to give an increase in manufacturing space, made necessary by the rapid growth of the business.

The Springfield Machine Company, Bridgeport, Conn., manufacturer of surface grinding machinery and abrasive wheels, is running four evenings a week, making a 70-hour week, the extra time being necessary by the volume of business in hand.

The Columbia Bolt & Nut Company, Bridgeport, Conn., is installing its machinery in its new shop at the West End. The change will afford 5000 square feet of additional manufacturing space. New machinery has been purchased and it is expected that more will be needed later on.

The increase in the plant of the Challenge Cutlery Company, Bridgeport, Conn., will make it one of the largest factories for the manufacture of razors and pocket knives in the United States and will increase the number of employees from 260 to 500. The new buildings, which will adjoin the present works, will cost \$75,000. One building will be 50 x 260 feet and three stories; the other, a forge shop, will be 40 x 150 feet and a story and a half. The company will need a little additional machinery later on.

The Haverhill Electric Company, Haverhill, Mass., is to erect a new power plant, in which will be installed two 1000-kw. Parsons steam turbines.

The Consolidated Lighting Company, Lawrence, Mass., contemplates installing a new steam turbine in its power station.

## Chicago Machinery Market.

CHICAGO, ILL., May 16, 1905.

Reports as to the condition of business among the local machinery merchants conflict. The majority of the local dealers and agents report business to be very dull, and many are disposed to blame the strikes for the loss of a good deal of business, because machinery purchasers hesitate to place orders for machinery which may be tied up by the teamsters' strike. Up to the present time there has been no ground for this fear, as the machinery people have not been interfered with and have been able to make deliveries promptly. One machinery house has secured a large amount of business from the International Harvester Company and from the Government, which has placed orders for the arsenal at Rock Island. A feature of the railroad machinery trade is the long delay in placing orders for machinery described in lists that were sent out months ago. The Chicago, Burlington & Quincy, the Alton, the Rock Island and Northern Pacific are among the roads that are delaying the decision on purchases. The Illinois Central has a large list out, and several other railroad lists are said to have been issued, though details are not obtainable at this writing.

The City Electrician has opened bids for machinery equipment for a new plant at Ninety-fifth and Erie streets. The bids are as follows: Two vertical cross compound condensing engines, 1000 horse-power each, Buckeye Engine Company, \$27,990; Shepherd Engineering Company, \$30,993; Fulton Iron Works, \$32,750; Quincy Engine Works, \$35,000; Allis-Chalmers Company, \$39,925. Three 400 horse-power water tube boilers, E. Keeler & Co., Williamsport, Pa., \$14,200; Heine Safety Boiler Company, St. Louis, \$15,707; Aultman-Taylor Company, \$18,600. Superheaters, Power Specialty Company, \$4176; Erie City Iron Works, \$4323; Aultman-Taylor Machinery Company, \$4500. Two 750-kw. generators, with exciter sets, switchboards, &c., Bullock Electric Company, \$18,860; Western Electric Company, \$19,500; General Electric Company, \$25,632; Stanley Electric Mfg. Company, \$26,019. Three mechanical stokers, Green Engineering Company, \$4395; Aultman-Taylor Company, \$4750; Hawley Down Draft Furnace Company, \$5250; Whiting Foundry Equipment Company, \$5685. Condensing apparatus, Wm. Baragwanath & Son, Chicago, steam driven, \$3451; electrically driven, \$4900; Platt Iron Works Company, steam driven, \$4050; electrically driven, \$4650.

The Twin City Rapid Transit Company, Minneapolis, Minn., will shortly break ground for extensive repair shops at University and Snelling avenues. The company owns 20 acres of ground as a site for the plant, and will cover a little over 7 acres of this with buildings. The largest building of the plant is said to be a car house, which will cover something over 3 acres and cost between \$175,000 and \$200,000. The company states that details of shop buildings are not yet complete and contracts have not been awarded.

Commissioner of Public Works Patterson is advertising for bids on six water tube boilers of 2640 square feet of heating surface, each for the Thirty-ninth street sewer pumping station. Chain grate stokers or Hawley furnaces are to be included in bids. Specifications call for boilers with straight tubes and without flat stayed surfaces.

The H. A. Stocker Machinery Company, Chicago, has purchased the business and good will of the Grinding Machinery Company, a jobber in abrasives and grinding tools at 25 South Canal street. Mr. Stocker has also secured the Chicago agency for the Norton Emery Wheel Company.

The Consolidated Construction Company, Mexico City, Mexico, recently formed, has in process of erection at Peralvillo a large plant, which will have a capacity of handling 40,000 tons of structural steel annually. The property on which the shops are going up is about 15 acres in extent. Steel and iron yards of the most modern character are to be provided with all the latest known systems of hoists, elevated tramways and other appliances for the most economical handling of heavy iron and steel. Machinery also will be installed for cutting, punching, riveting, painting and otherwise treating the steel and iron material. A large foundry is also to be established, as well as a sheet and galvanized iron plant. The Consolidated Construction Company was effected by taking over the Consolidation Company of Metal Constructions and several other contracting firms. The officers of the company are: President, Oscar Braniff; vice-president and treasurer, Emilio Pinson; secretary, Lic. Lance Duret. The directorate is composed of the above named officers and Thomas and Arthur Braniff, Miguel A. de Quevedo and J. Sternfeld. The technical manager is J. W. Hawke. The offices of the company will shortly be moved to the G. and O. Braniff Building, 19 Calle Cadeña, in order to provide greater facilities and more scope. Work is being actively pushed on the plant to have it completed before the rainy season sets in and its completion is expected within a couple of months. Details of the machinery equipment are not yet available, as much of it has not been specified.

The rebuilding of the burned portion of the plant of the Springfield Boiler & Mfg. Company, Springfield, Ill.,



was referred to in last week's issue. The firm states that it will buy a 150-kw. generator and a high speed engine either belted or direct connected to the generator. Also that its new building will be about 300 x 350 feet, with a main span 50 feet, on which will run an overhead electric crane. A large two-stage Blaisdell air compressor has already been purchased for the new plant.

Fred. C. Ayer, who has recently erected a factory at Chicago Heights, Ill., for the manufacture of metal specialties, will shortly add a large lathe and several smaller machines, such as grinders, screw machines, &c., to his equipment. The factory is completed and in operation in part. Mr. Ayer was formerly connected with the Baschen & Ayer Machine Company.

John Elliott, Faribault, Minn., has made arrangements for the erection of a foundry plant at Northfield, Minn. It will comprise a foundry, 45 x 48 feet; cupola room, 15 x 18 feet, two stories; engine and fitting room, 15 x 27 feet. There will be installed one tumbling barrel, 26 x 48; one emery stand with 30-inch wheels; two gas engines; one drill press; one elevator; one 8-ton traveling crane. Mr. Elliott also expects to install in the near future one planer, one lathe, one milling machine. Jobbing work of all kinds in the casting line will be taken.

The Des Moines Mfg. & Supply Company, East Des Moines, Iowa, has bonded its business for \$40,000, the additional capital being used in enlarging the plant. A number of new buildings will be erected and additional machinery which has been purchased will be installed. It is the plan to manufacture several lines of iron and steel ware. The firm has been conducting a boiler making and foundry establishment and machine shop, doing repair work and building special machinery.

John I. Beggs, the new president of the National Electric Company, Milwaukee, Wis., who succeeded S. W. Watkins, announced recently that the company would be re-organized or sold in the near future. Since Mr. Beggs took charge there has been a reduction of expenses in the National Electric Company, which amounts to something over \$100,000.

W. B. Woody, Rockdale, Texas, is preparing to install a briquetting plant to manufacture lignite coal into briquettes and eggettes. Mr. Woody states that he has 506 acres of land on the International & Great Northern Railroad, all of which has under it a strata of this coal 8 feet thick. He is now investigating the matter of a suitable binder for uniting the coal into the best briquette and expects to put in a 100-ton daily capacity machine after this has been selected.

The Morgan & Wright Rubber Company, Detroit, Mich., has purchased land and is about to erect a large plant to cost considerably over a half million dollars. It is hoped to have the plant in operation before the first of next year. Engines and boilers and much of the machinery equipment have already been contracted for. Rogers & Macfarlane, Detroit, are the architects who are preparing plans for this plant.

The Pittsburgh Plate Glass Company is erecting a plaster mill at Venice, Ill., which will make a wood fiber plaster. Contract for its machinery equipment has been let to the Des Moines Mfg. & Supply Company, Des Moines, Iowa, as follows: Three crushers, two 10-foot calcimining kettles, two mixers, a hair picker, wood fiber machine, two boilers, 72 x 16, a 200 horse-power Corliss engine, stokers, shafting, pulley wheels, loaders, &c.

The Davenport Gas & Electric Company, Davenport, Iowa, has purchased from the Murray Iron Works Company, Burlington, Iowa, the 1000 horse-power direct connected Corliss engine which was exhibited at the St. Louis World's Fair, and also the 600-kw. generator which was built by the Crocker-Wheeler Company, Ampere, N. J., and exhibited in connection with the Murray engine. These power units will be used by the Davenport Company to take care of additional street car and power business.

The Pittsburgh Reduction Company has removed its Chicago branch from 190 Monroe street to new quarters on the ground floor of the store at the northeast corner of Lake and La Salle streets. The firm will carry a greatly increased stock of aluminum in its new quarters, which comprise not only an office and storeroom, but a large basement. E. H. Noyes is manager of the Chicago office.

**Metal Trades Association Notes.**—There will be a meeting of the Cincinnati Metal Trades Association in the Odd Fellows' Temple May 18 to take up the subject of merging with the National Association. Immediately following the meeting a dinner will be served to those present. The St. Louis Metal Trades Association will also meet on the same day and for the same purpose. It is stated that 90 per cent. of the membership is in favor of this merger and that it will very likely be consummated.

## Cincinnati Machinery Market.

CINCINNATI, OHIO, May 16, 1905.

A careful survey of the machine tool interests for the past week shows conditions quite active, and new business being received in a very satisfactory manner. The plants without exception are working to their full capacity, and the fact is apparent that even then they are unable to accumulate any considerable stock. Domestic trade is far reaching and continues quite heavy, while foreign demand is way beyond normal and exceeds expectations. Possibly not since 1890 has it assumed such proportions as is the case at the present time, and the report is that it is still on the increase. Take Russia, for instance; for a long time it has been almost impossible for any of our tools to find their way to that country, while the report now is that they are beginning to feel the market in a very substantial way. Then, too, there is Germany, which has shown very little disposition for several years to come into this market, again making inquiries and promising better things for the future. It will probably never be known to a certainty just how potent a factor Japan has been in causing the present activity, yet if the business done in this city with that Government is any criterion of the country at large the aggregate amount would figure way up into the hundreds of thousands. In addition to this considerable new business from this Government has found its way here during the past few weeks, and several of our largest machine tool builders, especially lathe manufacturers, have added to their order books sufficient work to carry them far into the summer months. We learn that the railroads are beginning to show a deep interest in the trade and have prepared lists of tools in large quantities. One trunk line, we are told, has in contemplation the expenditure of a million and a half for betterments of this kind and now have inquiries out for ten machines, with others to follow in a short time. Then, too, the United States Government is making numerous inquiries for tools to be used at the navy yards at Boston, Norfolk, New York, Pensacola and Puget Sound. With this class of inquiries in the market and the country generally in a flourishing and prosperous condition, machine tool builders are looking forward to an active year.

Local foundry conditions are unchanged and, while the difficulties with the molders are apparently at an end and the foundries are being run on the open shop plan, business is very quiet and has failed to respond in the manner that was anticipated.

The strike of the architectural workers continues, although in a very quiet and peaceful manner. These workers are known as outside and inside men. The structural concerns have declared for an open shop and we are advised that quite a number of the inside men have returned to work at the old schedule. The outside men are still holding out, however, but this is apparently causing very little delay to work under way, as it is claimed that sufficient new men are being obtained to meet the emergency of the case.

Another large industry is being added to the city's number. This is the plant of Dana & Co., located at Norwood, one of the suburbs, which will cover about 3 acres of ground. There will be two one-story buildings, 60 x 154 and 154 x 185 feet respectively, of brick and iron construction. In addition to this will be the office building, which will be 25 x 80 feet, fully equipped with all the latest conveniences. They also expect to erect a foundry 70 x 100 feet a little later, where they will make the castings used in the manufacture of freezers. They will have a tinning and galvanizing plant, 38 x 60 feet, and a power plant, consisting of a 150 horse-power Skinner engine, direct connected to a Jansen & Leist generator, and a McIlvaine & Spiegel tubular boiler. The machinery, outside of a few drill presses and lathes, is all special and has been secured. The plant will be heated by exhaust steam vacuum system and the entire floor space will be amply protected by automatic sprinklers. They expect to be able to locate in their new quarters by September 1.

The Cincinnati Punch & Shear Company says that business is very much better with them than it was a month since. Trade was very slow in opening up this year for some reason, and instead of being active about the middle of January, when it was expected, did not materialize until late in April. It has disposed of all the stock on hand and is now working hard to fill orders. Among recent shipments made we note a straightening roll for Prentiss Tool & Supply Company at Buffalo; double punch for Ornamental Wire Works, Detroit; double punch for American Saw Mill Machinery Company, Hackettstown, N. J.; single punch for Evansville Metal Bed Company; single punch for Newton, Miss.; heavy single punch for Norwalk, Ohio; doubler for St. Louis. Orders are very general, among them is one for three special machines for Brunswick, Ga., for making stills, and a multiple punch for Macedon, N. Y.

The R. K. Le Blond Machine Tool Company says that export trade has apparently assumed the proportions of 1890, and is steadily increasing. It is in receipt of an order for ten lathes for European points, and inquiries for

its line of tools are being received from points abroad generally. At the present time the company has sufficient orders booked to keep it running to its full capacity for several months.

The Fosdick Machine Tool Company reports that business has assumed a more quiet condition during the past week, and while it is fairly busy there is an absence of the activity noted a week or two since. This is possibly attributable to the fact that its agents have enough stock for present requirements, and as it has been running to capacity for some months a lull at this time was not unexpected. Foreign demand is good, however, and the company is doing considerable export business with France, Germany, England and Italy.

The Queen City Machine Tool Company advises that it has found it utterly impossible to accumulate any stock, and though putting forth its most strenuous efforts is able to do nothing more than supply current demand.

The American Tool Works Company concurs with other builders in the report that trade is excellent and that its reports for the month of April show a very substantial gain. Foreign trade is growing and is a very strong factor in the present business.

The Cincinnati Milling Company reports a very satisfactory condition of trade both at home and abroad. It is looking forward to the time when the buildings it is now erecting shall be completed and increase the facilities of the plant. Work is progressing fairly well along this line and the company hopes to move in before many weeks elapse.

The Hisey-Wolf Machine Company since established in its new plant on Spring Grove avenue, Cincinnati, Ohio, has been enjoying a phenomenally good demand for its electrically driven portable and hand drills, and is in the market for some additional machine tool equipment adapted to its particular requirements.

## Cleveland Machinery Market.

CLEVELAND, OHIO, May 16, 1905.

The month of May is proving disappointing to the majority of local machinery dealers. Despite the reports of numerous improvements and additions, the demands for new machinery are small and inconsequential. The few orders being placed are for renewals to equipments, and the good business which, judging from past inquiries, should have arrived about this time has failed to materialize. And a peculiarity of the situation is that while dealers are securing but little business they are having difficulty in taking care of what they get, owing to the factories being backward about making deliveries. On certain classes of tools the big Cincinnati manufacturers are reported to be many weeks behind on orders. It appears that the bulk of this business is going abroad.

The Wm. Pollock Company, Youngstown, has been purchasing and making inquiries on machinery which will practically double its present capacity. A large building is under way which will be completed in about 60 days. An order was recently placed with Wm. A. Sellers & Co., Philadelphia, for a very large boring mill, and numerous other tools of various descriptions are being purchased. All the machinery will be electrically driven with individual motors, and the company is preparing to make important improvements at its power station.

M. Dunn, superintendent of motive power for the Pennsylvania lines west of Pittsburgh, informs us that the report that the company will erect a machine shop and install additional machinery at its Dennison, Ohio, shops is not correct. However, important improvements are to be made at this point. Authority has been granted for the erection of a new roundhouse at a cost of \$310,000, to include the following: Roundhouse to be 41 stalls, 85 feet between walls and 75-foot turntable; new mechanical coaling station of the Robbins belt conveyor type, 200 tons capacity; four new ash pits and necessary tracks, new sand house and a new oil house.

The Detroit & Cleveland Steam Navigation Company, Detroit, has placed a contract with the American Shipbuilding Company, Cleveland, for the erection of the largest passenger steamer ever built on the Great Lakes. She will be 450 feet long and will be propelled by engines of 6000 horse-power. The freight capacity of the vessel will be 1000 tons, and she will carry about 4000 passengers on excursion trips and about 1000 on regular runs. She will have a speed of 23 or 24 knots an hour.

The Board of Trade of Bowling Green, Ohio, has secured the plant of the D. M. Lefevre Arms Company, Defiance, Ohio. The company will be reorganized and moved to Bowling Green. Plans for a brick building, 30 x 150 feet, have been made. The company will make shotguns.

The Automatic Clutch Company, Akron, Ohio, has been formed by Will Christy, George Perkins, F. H. Adams, F. B. Thies and E. E. Andrews. The company is associated with the Akron Electrical Mfg. Company, Akron, and it will manufacture a new friction clutch for machinery, line shafting and automobiles.

The Foyer Steel Stamping Company, Painesville, has had plans prepared for a large addition and it will shortly install considerable new machinery.

The business of the Federal Mfg. Company, Cleveland, has been practically terminated. The plant and business of the Columbia Steel Works have been transferred to a new company known as the Columbia Steel Company. The business of manufacturing automobiles and parts has been turned over to a new company known as the Garford Company, which has been chartered with \$400,000 capital stock by A. L. Garford and others. The company will continue to operate the plants at Cleveland and Elyria and will make automobiles and parts to order, as well as commercial vehicles for trucking. The Elyria plant has recently been improved by the installation of considerable new machinery for producing small parts.

The Board of Public Service of Cleveland, Ohio, is advertising for sale two Cornish vertical pumping engines and six Cornish boilers at the Fairmount pumping station. This equipment has been in almost constant service for more than 50 years and it is still in good condition. It will be replaced with equipment of a more modern type.

The Joseph McCreery Company, Toledo, has been incorporated by Gail McCreery, King McCreery, Wm. E. Taylor and others to carry on the business of the late Joseph McCreery. The company will manufacture heating and ventilating apparatus and air cooling and cleansing devices.

The Cleveland Planer Works, Cleveland, is building a line of open side planers ranging in size from 30 to 60 inches and any length, and it reports a most pleasing demand for this line of tools.

The Fanner Mfg. Company, manufacturer of light castings and hardware specialties, has been buying considerable new machinery for the additions which it has under way, and it will buy some more in the near future. Recent purchases include heavy presses from the E. W. Bliss Company, New York, and the Toledo Machine & Tool Company, Toledo, Ohio; considerable electrical machinery and a 500 horse-power Green automatic engine. The new additions to the plant include a two-story building 80 x 250 feet, 100-foot addition to the foundry and a storeroom 40 x 140 feet.

The Lane Tool Company is having plans prepared for an addition 53 x 120 feet and one story high, to be used as an erecting and machine shop.

The Koepke Nut & Bolt Company, Elyria, manufacturer of nuts and bolts, finds its present quarters too small and it has arranged to move its plant to North Amherst, Ohio, in the shop formerly occupied by E. Steel. The company will soon be in the market for a 60 horse-power gas engine, line shafting, 2-ton power elevator and some new machinery.

Reference was recently made to the plans of the Mineral Ridge Mfg. Company, Mineral Ridge, Ohio, for erecting a large machine shop and power house to enable the company to engage more extensively in the manufacture of mining machinery. H. C. Hale, manager of the company, writes that it will shortly be in the market for an engine, boiler, generator and motors and for quite an extensive line of up to date machine tools of medium size. Mr. Hale, who has recently been appointed manager, was formerly mechanical engineer for the Webster, Camp & Lane Company, Akron, Ohio.

The Toledo-Massillon Bridge Company, recently incorporated, has organized with the following officers: T. H. Tracey, president; J. J. Swigert, vice-president; C. A. Peckham, secretary-treasurer; C. S. Davis, chief engineer. The above with C. A. Draper, C. L. Gates and J. K. Secor are directors. The company has recently taken over the plant and business of the Massillon Bridge Company, Massillon, Ohio. It is the intention to erect a large factory in Toledo this year and several sites are now under consideration. The company is capitalized at \$250,000, half of which is paid in, the remainder to be paid when the company builds its Toledo plant. C. S. Davis, chief engineer, writes that it is yet too early to give any information relative to the size of buildings or the tools that will be required.

The Midgley Mfg. Company, Columbus, Ohio, manufacturer of steel wheels and automobile rims, has abandoned its plan of removing its plant to some other city, and has secured a 6-acre site, where it will erect a new plant of large dimensions. Spur tracks from two leading railroads have been laid into the grounds, which will facilitate the building of the factory and the shipping of freight. Plans have been prepared and are now in the hands of contractors for the erection of two large buildings, one 50 x 1200 feet and the other 75 x 700 feet. They will be of brick and steel construction. Work will start at once and it is expected to have the plant ready for occupancy by September 1. The arrangement of the buildings will be such that the raw material will be received at one end, go through the various processes in a straightforward course and emerge at the shipping department ready for shipment. Each year for the past three years the company has found it necessary to double its facilities and the new plant will give it nearly three times its former capacity. The improvements will cost



about \$150,000, about half of which will be for new machinery. A separate power plant will be erected.

The A. C. Williams Company, Ravenna, Ohio, has been incorporated with \$200,000 capital stock to take over the plant and business of A. C. Williams of that city, manufacturer of hardware specialties and iron toys. A. C. Williams will be president and general manager of the company. J. H. Bigalow, a wealthy Cleveland merchant, has become interested in the company and will be vice-president and secretary, and W. H. Cole will be superintendent. The company is planning to make important improvements to the plant.

The Council committee on the municipal lighting plant for Toledo has instructed Mayor Finch of that city to secure estimates and specifications on the cost of installing a 2,000-light plant for the city. It is estimated that the plant will cost about \$300,000.

The Kerlin Brothers Company, Toledo, dealer in tubing and oil well supplies, has purchased the plant and business of the Kenton Gas & Electric Company, Kenton, Ohio, and is preparing to make extensive improvements to the plant, although it is not yet prepared to go into details.

The Mansfield Lumber Company, Mansfield, Ohio, is preparing to erect a machine shop, 60 x 130 feet and one story high.

The Milan Brewing Company, Milan, Ohio, will erect a new brewery. Bids for the building and equipment are being advertised for.

## Philadelphia Machinery Market.

PHILADELPHIA, Pa., May 16, 1905.

Conditions governing the local machinery market are practically unchanged. While some manufacturers and dealers have taken on a good amount of business, others have not fared so well, and the aggregate has not been as large as might be desired. Considerable more business could be transacted by nearly all the manufacturers without causing any inconvenience. Inquiries for new tools and equipment have not been as numerous as they might be, although in some branches of the trade there seems to be no falling off whatever. Demand for equipment for any large individual plants is noticeably absent, no new metal working plants of any size whose business has not already been placed being under construction in this territory, although contracts have been let during the past week for the building of a large textile plant and for additions to several local manufacturing plants.

Railway specifications have been rather quiet during the week past. The attendance of many railway officials as well as manufacturers of railway appliances, &c., at the International Railway Congress held in Washington, D. C., has no doubt had more or less to do with deferring of business at this time. This, however, was but temporary and manufacturers are looking forward to some good business from the railroads in the near future.

Foreign demand is weak; conditions abroad are not particularly favorable for extensive business at this time, while prices in this country are in many cases prohibitive. Manufacturers transacting a regular foreign trade advise us that orders being received are mostly for small quantities only.

There has been a more active demand recently for the smaller machine tools, while that for heavy tools has slightly diminished, this variation should be acceptable to both manufacturers and merchants, as it will enable them to clear both ends of their business, particularly where both classes are made or handled extensively.

Foundries have made no material gains. In some cases they are quite busy, but the general run of gray iron casting plants, and particularly jobbing foundries could take care of considerable more work. Steel casting plants, however, continue very busy, and in some cases it is difficult to get deliveries promptly.

Plans have been filed with the Bureau of Building Inspection for what will probably be the largest lace manufacturing plant in the country, to be built for Joseph H. Bromley, at the northeast corner of Twenty-second street and Lehigh avenue. The first structure to be erected will be the main factory, four stories and a basement, 521 x 68 feet. Five other buildings, including a duplicate of the one above mentioned, a power house and office building and two other structures are to be erected at a later date. It is estimated that two years will be required to complete the plant, the cost of which is estimated at over \$2,000,000. Wm. Steel & Son have the contract to erect the present buildings.

The Scott Paper Company, Limited, has begun work on a five-story brick addition to its plant at Seventh and Glenwood avenue. The building measures 88 x 28 feet, and will be used for general manufacturing purposes. Stewart Bros. have the contract to erect the building. No additional machinery or power equipment is to be purchased at this time, and it is probable that none will be required.

The Crane Company has let the contract for its new four-story warehouse at American, Master, Cadwalder and Jefferson streets. The building will be 86 x 232 feet, and the cost is said to be \$100,000.

The Espen-Lucas Machine Works continues very busy. Inquiries are good, and have been steadily increasing. Orders have been received for a number of steel foundry and special cold saw cutting off machines and for horizontal floor boring, milling and drilling machines. Two large cold saws were recently shipped to parties in the Middle West, as were also machines to New York and nearby parties.

The American Pulley Company is quite busy. Inquiries are numerous, and the resulting business is satisfactory. There has been no large increase in buying recently, but a fairly good average business is being transacted. Foreign demand continues quite active, recent deliveries of pulleys for export include shipments to London, England, Denmark and New Zealand. The domestic demand is distributed over all sections of the country; deliveries in quantity having been made to the South and West, as well as to local concerns.

I. H. Johnson, Jr., & Co., Incorporated, have had a large demand for their various types of lathes. Inquiries have been coming in quite freely and quotations have been made on a number of heavy tools. All departments of their plant are very busy, and from present indications will continue so for some time. Some recent deliveries of tools made by this company included one lot of 15 lathes to one party, while shipments of three and of six lathes have also been made, each to an individual concern.

The Link Belt Engineering Company has taken orders for a large quantity of work, and all departments of the plant are being operated at the best capacity. Among recent orders may be mentioned several for sugar cane and bagassa handling machinery in Cuba. It has the contracts to erect coal and ashes handling machinery for the John Wanamaker power plant in this city, a coal storage plant for the Lehigh Valley Railroad at Coxtown, Pa., and locomotive coaling stations for the New Jersey & Seashore Railroad at Atlantic City, N. J.; Pittsburgh & Lake Erie Railroad at New Castle, Pa., and rebuild one for the Norfolk & Western Railroad at Bluefield, W. Va. Coal handling machinery is also being installed by the company for the American Cold Storage & Ice Company, Philadelphia; Hackensack Water Company, Hackensack, N. J., and the Springfield Gas Light Company, Springfield, Mass. General orders, it advises us, are better than ever before.

Wickes Brothers, through their Philadelphia office, advise us of the recent sale of a number of engines, including a 35 horse-power slide valve engine to the McCay Lime Company, Bridgeport, Pa., and a hoisting engine to the Wrightsville Lime Company, Wrightsville, Pa. A 100 horse-power engine has also been sold to Wm. Whittaker & Sons. Inquiries for engines and machinery, they say, while not quite as good as they have been recently, continue in good volume and the indications for future business are considered favorable.

Considerable interest was taken locally in the International Railway Congress, and the American railway appliance exhibition in connection therewith, at Washington, D. C., May 3 to 14. Not only did the local manufacturers lend their presence to the meetings, but a number made very creditable exhibitions of machinery and appliances, among whom may be mentioned H. B. Underwood & Co., R. D. Wood & Co., Wm. Sellers & Co., Niles-Bement-Pond Company, Merritt & Co., Keystone Lantern Company, Wm. Wharton, Jr., & Co., Incorporated; Krips-Mason Machine Company, John Lucas & Co., Hale & Kilbourne Mfg. Company, Ajax Metal Company, L. J. Bords Company, Oil & Waste Saving Machine Company, &c., all of Philadelphia. The American Iron & Steel Mfg. Company, Lebanon, Pa.; Landis Machine Company, and the Landis Tool Company, Waynesboro, Pa., also made good displays.

## Government Purchases.

WASHINGTON, D. C., May 16, 1905.

The Executive Committee of the Isthmian Canal Commission has decided to purchase in the markets of the world the material and ships necessary for building the Panama Canal. This decision was reached with some reluctance because it was appreciated that there would be a great outcry from producers in this country if the purchases were not limited to American products. The commission is bound to construct the canal at as low a figure as possible, and cannot be blamed for buying where it can at the lowest price; but at the same time it must be taken into consideration that American money is building the canal and the American people ought to profit by the commission's purchases. Surely the manufacturers in this country ought to receive some concession as to price. The mere fact that the commission had to go abroad to buy a couple of ships at a fair price to transport supplies, because our ships are busy, is no criterion to go by. What is needed to construct the canal is not cheap but good apparatus, and if the commission, as it ought to do, will make a comparison and buy on merit there is very little chance of our machinery manufacturers losing much of the business.

The Bureau of Yards and Docks, Navy Department, Wash-

ington, will receive bids until June 10 for a 15-ton electric traveling crane for the Norfolk Navy Yard.

The following classes are specified in the proposals for machine tools for the Portsmouth, Boston and Norfolk navy yards, bids for which will be opened June 6:

#### Schedule No. 244.

- Class 1. One 2500-pound steam drop hammer.
- Class 2. One No. 76½ Bliss geared trimming press.
- Class 3. For installing complete a slow speed low pressure dust and shaving collecting system for saw mill.

#### Schedule No. 245.

- Class 11. Four portable electrically driven grinders and one portable electrically driven radial drill.
- Class 12. One electric traveling crane.
- Class 13. One horizontal boring and drilling machine.
- Class 14. One 6½-inch universal radial drilling machine.
- Class 15. One 48-inch radial drill.
- Class 16. One 30-inch upright drill.
- Class 17. One 25 x 25 inch by 6 foot planer.
- Class 18. One 30 x 30 inch by 8 foot planer.
- Class 19. One 20-inch friction clutch driven pillar shaper.
- Class 20. One 24-inch universal shaping machine.
- Class 21. One 28-inch shaper.
- Class 22. One plain grinding machine.
- Class 23. One universal grinding machine.
- Class 24. One surface grinding machine.
- Class 25. Four wet tool grinders.
- Class 26. One drill grinder.
- Class 27. One overhanging polishing and buffing machine.
- Class 28. One double 2-inch belt polishing machine.
- Class 29. One universal milling machine.
- Class 30. One universal milling machine.
- Class 31. One duplex milling machine.
- Class 32. One metal cutting band saw.

The Chief Quartermaster, Department of California, San Francisco, will receive bids until May 22 for a double cylinder single drum friction hoisting engine, boiler sufficient to develop 300 horse-power, and 950 feet of steel rope.

The following bids were opened May 6 for two traveling cableways for the naval station at Guantanamo, Cuba: Snare & Triest Company, New York, item 1, \$41,910.

Mead-Morrison Mfg. Company, New York, item 1, \$44,000.

Lambert Hoisting Engine Company, Newark, N. J., item 1, \$23,836; 1, \$26,236; 3, \$20,236; 3, \$22,636.

The Isthmian Canal Commission has awarded the contract for 12 steam shovels to the Bucyrus Steam Shovel Company, Bucyrus, Ohio, at its bid of \$151,800, with an additional \$150 per shovel for spotting device, and to the Mann-McCann Company, Chicago, Ill., three earth spreaders, \$14,607.

Under opening of May 2 for machinery for the Eastern navy yards, Richard W. Geldart, New York, was awarded class 1, one sand belt machine, \$139.94; John B. Westbrook, class 2, two electric emery grinders, \$592; J. A. Fay & Egan Company, Cincinnati, Ohio, class 5, one saw roller or stretcher attachment and re-tooth, \$46.68; class 6, one automatic emery wheel band saw scarfing machine, \$151.30; M. T. Davidson, Brooklyn, N. Y., class 7, two centrifugal duplex piston fire pumps, \$2360; class 63, 12 vertical single boiler feed pumps, \$594; class 64, two vertical steam pumps, \$96.

Under bids opened April 18 for motors for the Eastern navy yards, the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., was awarded class 2, three 10 and two 15 horse-power motors, \$1460.

Under bids opened April 11 for machinery for the Eastern navy yards, the Ingersoll-Sergeant Drill Company, New York, was awarded class 3, one duplex steam driven air compressor, \$7290.

**The Reed & Prince Mfg. Company Will Build a Wire Mill.**—The interesting announcement is made that the Reed & Prince Mfg. Company, Worcester, Mass., manufacturer of screws of all descriptions and similar lines, is to establish a wire mill and draw and finish its own wire, purchasing the rods instead of wire. The new mill, which will be on the company's premises near New Worcester, on the line of the Boston & Albany Railroad, will be of brick, 54 x 135 feet and one-story. No contract has yet been placed for the wire drawing machinery. Another large addition to the company's plant will be a four-story brick building, 65 x 70 feet. Several of the present departments are crowded and a part of the new building will be devoted to relieving this condition. It is probable that new lines will be added, which will take up the remainder of the new space. Altogether 150,000 square feet of additional floor space will be provided. The growth of the Reed & Prince Company's business has been very rapid. From a very small beginning 20 years ago,

in a basement room, it increased with such rapid strides that a large plant was erected and occupied less than two years ago. Since that time additional growth has compelled the new buildings now provided for. The present power plant will be sufficient to provide the necessary additional power. A spur track from the railroad will be put in, running alongside of the wire mill and the new factory building.

### Iron and Industrial Stocks.

NEW YORK, May 17, 1905.

Transactions during the week have been on a decidedly moderate scale as compared with the speculative activity of preceding weeks. Fluctuations have been within rather narrow limits. The most important changes up to Tuesday's close were as follows: Locomotive common advanced from 48¼ to 52¼, Steel Foundries preferred from 56 to 59¼, Pressed Steel common from 38½ to 40 and the preferred from 93 to 95, Tennessee Coal from 79¼ to 82¼. Last transactions up to 1.30 p.m. to-day were made at the following prices: Can common 11¼, preferred 69½; Car & Foundry common 35¼, preferred 98½; Locomotive common 52¼, preferred 112½; Colorado Fuel 45; Pressed Steel common 39½, preferred 94¼; Railway Spring common 34¼, preferred 97; Republic common 19, preferred 74; Sloss-Sheffield common 78, preferred 115; Tennessee Coal 81; United States Steel common 30½, preferred 97¼, new 5's 94¼.

**Dividends.**—Barney & Smith Car Company has declared a quarterly dividend of 2 per cent. on the preferred stock, payable June 1.

### The Stove Founders' National Defense Association.

—The twentieth annual convention of this association was held May 9 in Chicago. Two sessions were held. The forenoon session was devoted largely to a discussion of the agreement made by the Conference Committee with the Iron Molders' Union, particularly with respect to the apprentice ratio. Some opposition to the submission of the association to dictation from the Molders' Union on this important matter developed, but the agreement was ratified by a large majority vote. Other features of the Conference Committee's agreement were discussed at the afternoon session and the whole agreement was ratified. The executive officers of the association were re-elected as follows: President, Chauncey H. Castle, Quincy, Ill.; vice-president, Henry Cribben, Chicago; treasurer, A. C. Mott, Philadelphia; secretary, Thomas J. Hogan, Chicago.

To take care of its constantly increasing business the American Steel Foundries are making improvements and additions to its various foundries in the East, and to better handle these plants the executive officers of the company have decided to transfer the district manager's office from Alliance, Ohio, to Sharon, Pa. New office buildings are being erected at Sharon, where a sales department will also be located. The improved facilities for doing high class work in all kinds of miscellaneous steel castings will undoubtedly result in a still further increase in this company's business.

John S. Beggs has been appointed receiver for the National Electric Company, Milwaukee, Wis. The appointment of a receiver was merely to protect the creditors and to make it possible to continue the plant in operation.

The William B. Scaife & Sons Company, Pittsburgh, Pa., has designed and erected a mill building 78 x 172 feet, of steel frame construction, and covered with corrugated iron, for the Broomall Iron & Steel Company, Belington, W. Va.

The American Steel Foundries have received an order from the Atchison, Topeka & Santa Fé Railway Company for 2000 cast steel truck bolsters for 1000 combination stock and coke cars to be built at the Madison shops of the American Car & Foundry Company.



# HARDWARE.

THERE are occasional indications of a disposition on the part of the retail merchants to find fault with those who sell department stores and to take the position, more or less definitely, that this class of trade should be under the ban of manufacturers and jobbers, who should accordingly refuse to supply goods to them because they are troublesome competitors of the retail distributors. Indeed, this matter has recently been brought to our attention in a letter from a leading Hardware merchant in a Western city, who complained that a prominent jobbing house was furnishing a stock of goods to a department store with which he would be called upon to compete. Occasionally, too, in Hardware conventions references are made in a spirit of criticism to jobbing houses who sell department stores, as if this were an act of hostility to the regular Hardware trade. To the credit of the retail Hardware organization movement it should, however, be noted that the associations generally have not taken a position in opposition to the selling of goods to such stores, recognizing not only the futility of such opposition if it should develop, but the fact that it would be an attempt to dictate to manufacturers and jobbers in regard to matters which are to be determined in accordance with their own business judgment and interest.

If an attempt were made to carry out the principle that Hardware should be sold only to what are recognized as Hardware stores it would obviously be impossible to draw the line. It would be like attempting to define a jobber and to classify and separate the wholesale and retail merchants of the country—very easy in a multitude of cases, but impracticable in others which lie near the border line and perhaps overlap on either side. There are many States in which Hardware is sold principally in regular Hardware stores, with comparatively few goods which are not generally regarded as part of a Hardware stock in the broader meaning of the word in these days of expanding trade. Thus in the Northern and Eastern States Hardware is handled very largely by merchants who confine themselves to this line. In many places in the South and Southwest a large part of the Hardware business is done by general merchants, who carry not only Hardware but miscellaneous merchandise, while in all parts of the land country stores are found in which there is a strange medley of goods, including a modest assortment of Hardware. The department store is indeed only a general store greatly enlarged in its scope and up to date in its methods, located on a thoroughfare with its trolleys instead of on a crossroad in a farming district. Those who are disposed to condemn selling department stores would do well to attempt to formulate the principle on which they do so and to test it by endeavoring to give it a general application.

In a somewhat similar spirit there are those who complain because certain kinds of Hardware are sold to merchants in lines outside of the Hardware field. There is even in association meetings a disposition sometimes manifested to condemn those who do not confine their business to strictly Hardware houses. While the retail Hardware merchant is constantly enlarging his lines, which might be characterized as poaching upon ground formerly covered almost exclusively by other merchants, it is a little inconsistent and ungracious to criticize those who are reaching out for trade with houses who desire to

continue to carry their goods or to begin to do so. To lay down the principle that only the regular Hardware trade should be sold any kind of Hardware would be condemning practically every jobber in the country and many of the manufacturers, for they generally find it necessary in canvassing for business to go to outside merchants as well as those who sell nothing but Hardware. The inexorable expense account requires that salesmen visiting towns should sell as a general thing not only Hardware merchants but those also in other lines. In exceptional cases where their relations with Hardware merchants are such as to make it good policy to do so they may keep away from other stores. The sacrifice involved in giving up business within their reach may be justified by the special circumstances. As a general rule, however, the jobber goes to other houses besides the Hardware merchant because it pays him to do so. In one sense he is obliged to do it.

In selling merchants in other lines and in selling department stores it must be remembered that the principle involved is very different from that concerned in dealing with catalogue houses. The department store and the others in which Hardware is carried are simply retail establishments with the same kind of expense and very much the same methods and business problems as those of the Hardware merchant, and they have the same local identification with their communities. It is fair competition on equal terms, and the Hardwareman should be able to hold his own. If he is not there is fault in his methods which he should set about to correct. If he finds a grocery store selling Tinware or a drug store selling Pocket Cutlery it will be the part of wisdom for him to accept the competition in a good-natured matter of fact way, while at the same time he gives a little more thought to the best way of holding and extending his trade, and puts at once a little more vigor and enthusiasm into the conduct of his business.

## Condition of Trade.

While questions as to the tone of the market and its probable course so far as prices are concerned are always of interest to merchants who deserve the name, the attention of the distributing trade is now directed principally to the marketing of goods. Jobbers, with their usual enterprise, are actively represented in the field by thousands of traveling salesmen, who are assiduously cultivating the smaller merchants and succeeding in disposing of large quantities of goods. The retail merchants, on the other hand, at this time, when the season is well advanced and things are moving with a good degree of activity, are bending their efforts to supplying the wants of the consuming public and to transferring into use the excellent stocks which they are carrying. In the success which is attending these efforts there is little ground for complaint. Business, both with jobbers and retailers, is good, and orders for the replenishing of stocks are frequent, if not heavy. The disposition is to purchase in quantities to cover early requirements and avoid overstocking. This policy, adopted by both wholesale and retail merchants, is pursued with the feeling that goods are not likely to be higher, and may be lower. The slight yielding in price which has developed in some heavy lines contributes to this feeling, while the excellent conditions which prevail and the good trade which is in progress give confidence for the future and lead the merchants to purchase without hesitation such goods as they need in order to keep stocks well assorted and

sufficient for continued good business. In all parts of the trade there is the manifestation of much enterprise, as manufacturers, jobbers and retailers are putting forth increased efforts to extend their trade. Notwithstanding the large development in the capacity of manufacturing plants, still further enlargement is constantly in progress in a multitude of cases. Similar enterprise, though on different lines, is manifest in the operations of the distributors of goods. The profit which has attended business within the past few years has put all classes into excellent condition for such efforts, while the outlook is regarded as justifying them.

#### Chicago.

The most important event of the Hardware trade that has developed during the week past was a large meeting in Chicago of independent Wire manufacturers in which steps were taken to curtail production and to seek if possible to prevent the demoralization of prices which has recently been in evidence. The effort of the independent makers will be to hold the prices of Wire Nails to the basis of \$1.95, Chicago, to jobbers, and \$2 to retailers in car lots; Barbed Wire on the basis of \$2.10, Chicago, for Painted and \$2.40 for Galvanized, to jobbers in car lots, and 5 cents higher to retailers in car lots; Smooth Fence Wire, base size, \$1.80 for Annealed Wire to jobbers, and \$1.85 to retailers, in car lots. Jobbers have been asked to discontinue selling Nails at less than \$2.05 to \$2.10 to their customers and to maintain a corresponding advance over mill prices on their other Wire products. A good demand prevails for Builders' Hardware, and one large interest here reports that April business was 23 per cent. greater than any previous month in the history of the Chicago branch. Other factors in Builders' Hardware also make favorable reports for the month of April, though in some cases their business fell behind that of March. An exceptionally heavy trade has developed in Lawn Mowers, owing to the phenomenal growth of grass due to the long season of wet weather. For the same reason business on Garden Hose and fixtures has been almost at a standstill. The season for the sale of Poultry Netting has about closed and it has been a good one. Wire Cloth is becoming very active in demand. Steel Goods continue to be good sellers, though the season in this line is drawing to a close. There is somewhat less disposition on the part of retail merchants to be in a hurry to cover their requirements on Stoves and Furnace Supplies, because there seems less likelihood of an advance in price now than there was a month or two ago. However, the material which enters into the Stoves and Furnaces to be made for the coming season will average at least \$4 a ton higher in cost than for the past season, and higher prices are still among the possibilities.

#### Baltimore.

CARLIN & FULTON.—The spring season is rapidly drawing to a close, and will soon be succeeded by the dulllest period of the year. The long protracted winter and the cold weather of March has made this a very short spring, and has congested into a few weeks the business which otherwise would have extended over several months, and has delayed and interfered with the distribution of many heavy staples. The market prices have, however, been well sustained, as the factories seem to have been generally busy, and raw material, according to all accounts, has been both scarce and high.

Unfavorable weather has kept back agricultural work, but now from all accounts the wheat crop promises well, and we hear that there will be an abundance of fruit. For some reason unexplainable (unless perhaps through dissatisfaction with Congressional investigations) there has been a lack of refrigerator cars, and the shippers of strawberries from the Carolinas have been greatly inconvenienced, and have lost money by their inability to get their fruit to the markets in suitable condition.

The price of cotton will be, of course, an important factor in next fall's business, though we believe if even

the present low price can be maintained business will be good provided a large crop is secured. The country generally is in good shape, and though we may now expect two months or so of quiet business we have no doubt that at the proper season trade will resume its normal proportions and continue good throughout the year.

#### Cleveland.

THE W. BINGHAM COMPANY.—Spring goods are going forward now in large quantities. We are getting many duplicate orders for some lines. There will be a scarcity of Refrigerators this year and those who have not bought had better have their wants supplied at once. The manufacturers, on account of the late season last year, did not make up as many as in former years, and at the present time a shortage is reported. Cleveland jobbers, however, have a fair supply in stock. We advise retailers to anticipate their requirements and enter their orders at once. The frequent warm rains we have had of late all over the country are going to make an increased demand this year over former years for Lawn Mowers, Grass Hooks, Scythes and Grass Shears.

Nails and Wire are going forward in liberal quantities. Prices are low. Bolts, Screws and Hinges are in good demand. There are well assorted orders coming in at the present time for all kinds of Builders' Hardware and Shelf Goods generally. The demand for Mining, Milling, Manufacturers' and Railroad Supplies is very large at the present time.

Jobbers are busy in all departments. On many kinds of goods prices are altogether too low. Dealers needn't be afraid to buy liberally at present prices. A large amount of Merchant Pipe, Malleable, Cast and Brass Fittings, Packing, Belting and kindred goods used by the manufacturers are in good demand. On the whole trade in all lines is very satisfactory.

#### St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Business continues fair. It is better in the Northern and Western States than in the South. In many sections on account of the excessive rains planting is late. Winter wheat is six points above the ten-year average. Complaints of high water come from some sections, while loss of life and destruction of property by cyclones is reported from others. Our brother merchants in Chicago are fighting for the privilege of using the streets of their city. After the strenuous life forced upon us during the World's Fair last year, we are well content to have an opportunity of devoting our entire time uninterruptedly to our business.

#### Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The Hardware jobbers of this city report that they are still having a fairly good business and that the volume of sales is running probably a little ahead of last year at this time. The season, however, is close at hand when the Southern jobbers begin to feel the summer dullness coming on. Most all of the houses are either invoicing stock or preparing to do so, as the month of June is probably the lightest month in the year in the Hardware trade of the South.

A good many of the salesmen are taking some nice fall orders for such lines as Heating Stoves, Toy Wagons, Ammunition, Guns, Cutlery, Saddles, Harness and Horse Collars, for future shipment. Collections are first class and prices are being fairly well maintained.

#### Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The market is steady. There is a rather unusually free demand for goods, considering the time of the year. As a result of the decline in the price of Scrap, Bar Iron has shown a downward tendency, which brings it more nearly on a parity with Steel, but it is still in good demand and bringing a fair price. There is by no means a run on the market or anything of that sort to get excited over; there is too much building, original construction and repairs in sight to permit any of the great staples going on the toboggan yet a while.

All of the lighter forms of Hardware and more highly



manufactured stock are in excellent demand in both town and country. No trouble to the manufacturers to pay their dividends this year we opine. The meeting next month at Virginia Hot Springs of the Southern Jobbers and of the Manufacturers' Association promises to be one of unusual magnitude and interest. There is no one question pressing that we know of, except how to make profits with the least expense and trouble. That is an ever interesting theme, and a plain fare of elemental truths and principles is not a bad thing for us once in a while after being gorged on catalogue houses and novel methods of alluring customers, or dressing show windows or keeping tab on traveling men.

#### Portland, Oregon.

**CORBETT, FAILING & ROBERTSON.**—The satisfactory state of affairs heretofore reported throughout the Pacific Northwest continues, with bright prospects for the future. Trade jogs along in most lines as it has in the past with seasonable and regular volume. Since Home-seeker's rates were put into effect by transcontinental lines one railroad has brought 11,000 people into Oregon, a bright augury for the future business of this section. The Order of Railway Conductors is now in annual session here, accounting for some 3500 strangers within our gates. It is the first of many national conventions to assemble here during the year of 1905. Collections are not up to what we might reasonably desire and expect; in some sections there is nothing doing.

#### Omaha.

**LEE-GLASS-ANDRESEN HARDWARE COMPANY.**—The weather recently has been very unfavorable for outdoor operations and it is really a wonder that the volume of business has kept up so well and satisfactorily as it has since March 1. Everything is very late this year, which means that all necessary planting and farm work that have been postponed must now receive prompt attention, and until this important labor is accomplished it is probable that the volume of business will be temporarily curtailed.

All indications point to an excellent demand for goods as the season advances, with prospects for a large trade during the coming months. A large amount of building is in progress throughout the entire territory tributary to this market. Consequently labor of all kinds can find ready employment at good wages. The country west of the Missouri River may be reported as continuing in a very prosperous condition, and as long as there is plenty of business in sight, backed by favorable climatic as well as financial conditions, everything points to a large and rushing trade through the summer months.

### NOTES ON PRICES.

**Wire Nails.**—A meeting of the leading independent manufacturers of Wire products was held in Chicago May 11. The meeting was called in order to consider the steps to be taken in view of the weakening tendency in these lines, which has been caused by the moderate demand during the spring months, with the large quantity of Wire products, particularly Nails, which were purchased last fall for speculative purposes by those not directly identified with the Hardware trade. These stocks, in addition to overstocks in jobbers' hands, had become burdensome to carry, and the desire to realize on them has caused irregularities in the market both on the part of the jobbing trade and also in prices of some of the manufacturers. Some of the independent manufacturers were in favor of advancing prices to counterbalance the weakening tendency of the market but were unable to secure the co-operation of the American Steel & Wire Company in what was considered by them to be an unwise move. It was finally agreed by the independent producers to use every effort to prevent cutting of prices, in which attempt the American Steel & Wire Company agreed to give all possible aid. There will also probably be an effort to curtail production during the dull months if the condition of the market should require the adoption of this course. Quotations accordingly remain as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....\$1.80  
Carloads to retailers.....1.85

**New York.**—The local demand continues fair and from points tributary to this city orders are accompanied with requests for immediate shipment. The market is firm and New York quotations are as follows: Single carloads, \$1.99; small lots from store, \$2.05.

**Chicago, by Telegraph.**—There is now no longer any likelihood of an advance in prices, as the matter was thoroughly discussed at a meeting of independent manufacturers held in Chicago last week, and the attitude of the American Steel & Wire Company opposing an advance was also frankly presented at that meeting. The conclusion of the meeting and the policy of the manufacturers will be to devote their energies to maintaining the present prices of Nails and of Wire Goods rather than attempting to make an advance. These official prices are as follows: \$1.95, base, in car lots to jobbers; \$2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

**Pittsburgh.**—A well attended meeting of the independent Wire Nail interests was held in the Grand Pacific Hotel, Chicago, on Thursday, May 11. Present conditions and outlook for the Wire Nail trade were thoroughly discussed, and it was the consensus of opinion among those present that determined effort should be made to absolutely maintain present prices of Wire Nails, as nothing could possibly be gained by making an open reduction in the price or making concessions. All the mills present pledged themselves to absolutely maintain present prices, and some were in favor of an early advance, say about June 1, but no action on this was taken. The mills report slight improvement in new demand for Wire Nails, and jobbers' stocks are moving out more freely. Another meeting of the Wire Nail interests will probably be held early in June, but no definite date was set. We quote Wire Nails at \$1.80 in carload lots to jobbers and \$1.85 to single carload buyers, actual freight from Pittsburgh to point of destination being added. We are advised that the mills are now rigidly adhering to these prices.

**Cut Nails.**—The action taken at the Chicago meeting will naturally have the tendency of further strengthening the Cut Nail market. Demand from manufacturers shows a slight improvement. Quotations are as follows: Carload lots, \$1.80; less than carload lots to jobbers, \$1.85, and to retailers, \$1.95, f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails.

**New York.**—The local market appears to be in better condition since the meeting of the Cut Nail Association, when it was agreed to use efforts to prevent cutting of prices. New York quotations are as follows: Carloads on dock, \$1.94; less than carloads on dock, \$1.99; small lots from store, \$2.

**Chicago, by Telegraph.**—Automatically the price of Cut Nails will be officially reaffirmed and the tone strengthened with the reaffirmation and strengthening of Wire Nails. An effort is being made to hold the actual Cut Nail prices to the Wire Nail basis, though with only partial success, as Steel Cut Nails are still sold in car lots to retailers or consumers at \$1.90, base, and to jobbers at \$1.85, both prices being 10 cents below the official Wire Nail schedule. Iron Cut Nails made from Muck Bar Iron are ordinarily quoted at from \$1.95 to \$2, with some makers able to secure even higher prices because of a reputation for quality.

**Pittsburgh.**—New demand for Cut Nails is light, but is showing slight betterment. The makers of Cut Nails will be guided by any action taken by the Wire Nail mills, and if an advance in prices on the latter is made a corresponding advance in Cut Nails will follow: We quote Steel Cut Nails at \$1.70 in carload lots and \$1.75 in less than carload lots, f.o.b. Pittsburgh. For strictly Iron Cut Nails an advance of 10 cents a keg is charged over above prices.

**Barb Wire.**—The market is likely to be strengthened as the result of the meeting held in Chicago last week. Demand from mills is light. Quotations are unchanged

as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

**Chicago, by Telegraph.**—There is a disposition to hold prices firmly on the basis of car lots to jobbers, Painted Wire, \$2.10; Galvanized, \$2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, \$2.25; Galvanized, \$2.55; Staples, Bright, in car lots to jobbers, \$2.05; Galvanized, \$2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

**Pittsburgh.**—Very little fence building is going on now throughout the country, and for this reason new demand for Barb Wire is light. At the meeting of the Barb Wire makers in Chicago last week all present expressed themselves in favor of rigidly maintaining present prices, and the tone of the market is quite firm. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

**Smooth Fence Wire.**—A slight improvement in demand is reported by the mills. Now that buyers are assured that no reduction in prices will take place they will be in a position to place orders with more confidence. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.65
Retailers, carloads.....	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized....\$0.30	.35	.40	.45	.55	.65	1.05	1.15		

**Chicago, by Telegraph.**—Prices are firm and unchanged, as follows: \$1.80, base, for Annealed Wire, in car lots to jobbers; \$1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

**Pittsburgh.**—New demand is light, but is slowly showing improvement, while jobbers report that their heavy stocks are moving out more freely than for some time. No change in prices was made at the meeting of the Wire interests in Chicago last week, but all mills present agreed to rigidly maintain present prices. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.65
Retailers, carloads.....	1.70

**Sheet Zinc.**—Under date May 12 a reduction is announced in the price of Sheet Zinc, which is now quoted at \$7.25 per 100 pounds in 600-pound casks, f.o.b. mills, subject to the following discounts for cash and quantity:

	Cash with order.	Quantity. Per cent.	Total. Per cent.
Carload lots.....	3	5	8
9,000-pound lots.....	3	3	6
6,000-pound lots.....	3	2	5
3,000-pound lots.....	3	1	4
Less than 3,000 pounds.....	3	0	3

**Stove Boards.**—The Stove Board market is not in a materially different position from the last season, but feels the effect of the higher price which is ruling in Sheet Zinc. The list prices are substantially the same as a year ago and the discount to the trade generally is about 40 and 5 per cent. on the general line of Stove Boards, the Paper Lined Embossed being about 10 per cent. less. The manufacturers are working together in harmony and anticipating an excellent business. There seems, however, to be a disposition on the part of some of the jobbers to cut prices liberally on these goods, and in some cases it is intimated that they are selling them at about cost.

**Vitrified Sewer Pipe.**—The demand for Sewer Pipe is fair, not, however, up to that for the corresponding season a year ago. The prices which have been in effect for about three months in the eastern section of

the country, where the entire production is practically under the control of one concern, are well maintained. The following discounts are for Standard Pipe and Fittings, 2 to 24 inch, in carload lots:

New England.....	68%
New York and New Jersey.....	71%
Maryland, Delaware and eastern Pennsylvania.....	75%
Western Pennsylvania and West Virginia.....	77%
Virginia.....	76%
Ohio, Michigan and Kentucky.....	77%
Indiana.....	77%

**Paris Green.**—The price agreement entered into by manufacturers early in the season is still in force and is maintained. Demand is light, but if it were heavier there would be a possibility of an advance in prices. Quotations for 5 tons or over are as follows:

Arsenic, kegs.....	12 c.
Kegs, 100 to 175 pounds.....	12½c.
Kits, 14, 28 and 56 pounds.....	13½c.
Boxes, 2 and 5 pounds.....	13½c.
Boxes, 1 pound.....	14 c.
Boxes, ½ pound.....	15 c.
Boxes, ¼ pound.....	16 c.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds.....	1 c.
1000 to 5000 pounds.....	1 c.
500 to 1000 pounds.....	1½c.
Less than 500 pounds.....	2 c.

**Window Glass.**—The Manufacturers' and Jobbers' Window Glass Association has practically wound up its affairs. The office at Pittsburgh has been closed and 95 per cent. of the money in the treasury is to be returned to the members of the association pro rata. The balance of the money in the treasury, 5 per cent., is to be retained for incidental expenses and for the purpose of calling the next meeting, if any is ever called. Nominal headquarters are to be in charge of the former treasurer at Kane, Pa. The association was formed in the fall of 1904 to improve trade conditions by discouraging the practice of selling by the manufacturers to the retail trade. Jobbers agreed to buy only from manufacturers who were members of the association and manufacturers pledged themselves not to sell to jobbers outside the organization. Prices were fixed by the Executive Committee of the association from time to time below which Glass was not to be sold. Reports differ as to the cause of abandoning the organization; one is to the effect that from its inception it lacked unity of action, while another is that the work for which the association was organized has been satisfactorily accomplished. The former manufacturing and jobbing members are now at liberty to carry on their business in the same manner as if the organization had never existed. It is stated that at the recent meeting members showed no indications of willingness to meet the price of machine made Glass.

**Rope.**—During the past week or more there has not been the increase in demand manufacturers had anticipated with the advance of the season. The weak market in Sisal fiber has had a tendency to cause a weakness in Sisal Rope, though no change in quotations has been announced by manufacturers. General quotations are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8¼ cents per pound.

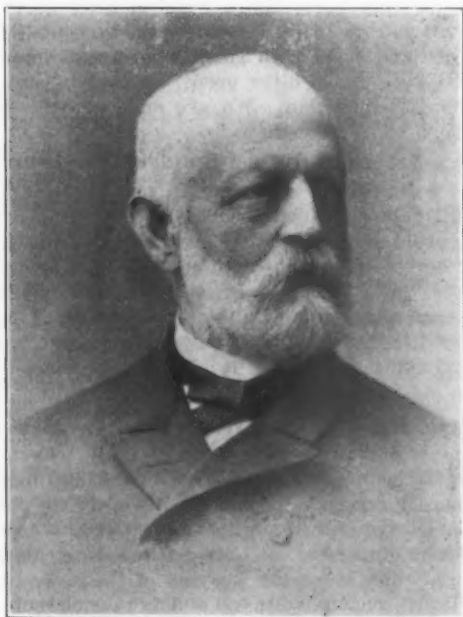
**Oils.**—*Linseed Oil.*—The market is strong, quotations on seed having advanced. This, with a dull and weak market for cake, may advance the price of oil. Deliveries on contracts are being made, but new business is confined to jobbing lots, as crushers and large buyers are awaiting future developments. Quotations are unchanged, as follows: City raw, 48 to 49 cents per gallon, according to quantity; State and Western Raw, 46 to 47 cents.

**Spirits Turpentine.**—The market is strong and advancing, owing to some speculative influence in the South and to the moderate receipts, owing to the backward season. The large movement of perishable freight at this time from the South results in a scarcity of freight space on sailing vessels, so that small receipts of Turpentine are expected at this point during the remainder of the month. New York quotations, according to quantity, are as follows: Oil barrels, 65 to 65½ cents; machine made barrels, 65½ to 66 cents per gallon.



### DEATH OF WILLIAM F. HYATT.

**W**ILLIAM F. HYATT, president of the Brass Goods Mfg. Company, Brooklyn, N. Y., died at his residence in that city, May 12, in his eighty-first year. Mr. Hyatt was born August 2, 1824, in what is now East Broadway, New York, his parents moving to Norwalk, Conn., a few years later, where he remained for some time. Returning to New York, he entered the employ of Charles Merrill & Son, 556 Grand street, who were Hardware merchants of long standing, the business being still conducted by a son, Henry W. Merrill, whose father lived to the ripe old age of 93 years. After remaining with the Merrills for three years Mr. Hyatt joined the "argonauts" who in 1849 sought gold in California. Returning to New York in 1851, he re-entered the store of his former employers. A year later he was employed by J. B. Sargent, afterward Sargent & Co., then located at 24 Cliff street, with whom he remained until 1855. The following year Mr. Hyatt became a partner in the Hardware business in Platt, near Pearl street, the firm name being



WILLIAM F. HYATT.

Sullivan, Schofield & Hyatt, later Sullivan & Hyatt, who were succeeded by Hyatt & Spencer, at 54 Beekman street, the latter firm being dissolved in the seventies and Mr. Hyatt continuing alone until about 1876 at the Beekman street address. Shortly afterward Mr. Hyatt established the Brass Goods Mfg. Company, the factory of which is located at 86-92 Third street, Brooklyn, and of which he continued president until his death.

Mr. Hyatt was a straightforward and exceptionally conscientious man. He was highly esteemed for his sterling and genial qualities, a business associate, also a manufacturer, who had known him intimately for over half a century, referring to him as one who would not knowingly do a wrong act. Despite his extreme age Mr. Hyatt by correct living and regular exercise was a well preserved man. He is survived by a widow, two daughters and two sons, one of whom, Herbert O. Hyatt, is treasurer and general manager of the Brass Goods Mfg. Company, the other being connected with banking interests.

### ARKANSAS RETAIL HARDWARE DEALERS' ASSOCIATION.

**T**HE next annual meeting of the Arkansas Retail Hardware Dealers' Association will be held on June 21, 22 and 23, at Gleason's Hotel, Little Rock. This association has had a material growth during the past year, and indications point to an exceptionally large attendance at the meeting. Representatives of many job-

bers and manufacturers are expected to be present. Among other important matters which will be brought up for discussion will be the advisability of organizing a mutual fire insurance company for the benefit of the members. While arrangements are being made for a strong business convention the social side will not be neglected.

### BRANCH STORES OF SIMMONS HARDWARE COMPANY.

**M**UCH interest attaches to the action of the Simmons Hardware Company, St. Louis, Mo., in the establishment of branch stores, in regard to which some unfounded rumors have been in circulation. In reply to our inquiry to the company as to the facts in the case we have the following advices in regard to their plans and the reasons which have influenced them in the steps they are taking:

We have not started and do not intend to start any retail stores anywhere, nor have we any connection with them, with the exception of our alliance with Neal & Brinker of New York City, as explained through your columns several months ago. We have started and expect to prosecute vigorously wholesale houses: one in New York, which is simply the beginning of what we hope will be a very large enterprise; one in Minneapolis, where we bought out the jobbing house of the Nelson-Bouquet-Holliday Hardware Company and which business we expect to conduct as a wholesale house only, and in a very large way—that house does not sell and does not intend to sell a dollar's worth of goods at retail. We also bought out the Baker Hardware Company at Sioux City, which was a wholesale house and, as far as we are informed, has always been. It is not our purpose or intention to sell goods at retail from that house, not even to our employees—it will be, strictly speaking, a jobbing house. We are also building a store at Wichita, Kan., where we expect to open up a first-class Hardware house and which also will be exclusively wholesale.

This house has at all times done everything in its power to protect and assist the retail Hardware merchant, to whom it is indebted for its great progress and present success, and there is nothing we can do to assist the retail Hardware dealer to be successful that is not being done or that will not be done in the future, because the interest of the retail Hardware merchant and our interest are so interlinked that they are just as mutual as it is possible for two interests to be.

We have for some time recognized that it was growing more and more difficult for us to supply from St. Louis merchants who lived long distances from our headquarters. A number of them have convinced us that the matter of prompt or quick service, as well as good and complete service, was a more important feature than price, and no matter how low prices we made we found it difficult to compete with a local jobber who could get his goods to the retail merchant in two or three days from the time they were ordered, whereas it required from two to three weeks sometimes for us to get our goods to the same merchant. This condition caused us to believe it wise to establish wholesale Hardware houses in different sections of the country in order to more quickly and better supply the demands of the trade within a reasonable radius of those centers where we place such establishments.

BLAISDELL MACHINE COMPANY, Waterville, Maine, has recently purchased the manufacturing and repair business of Ansel Farnham of that city, which will be continued by the company in connection with its own lines.

N. H. BRAGG & SONS, wholesale and retail Iron, Steel and Heavy Hardware, Bangor, Maine, have incorporated their business, which was established 51 years ago, with a capital of \$100,000, fully paid. Charles F. Bragg is president; Franklin E. Bragg, treasurer, and R. E. Bragg, secretary.

## SELLING SCREENS MADE TO ORDER.

**I**N our issue, 4th inst., we presented extracts from letters from a number of prominent manufacturers of Door and Window Screens which enforced the feasibility and desirability of Hardware merchants generally taking up the sale of Screens made to order. It was shown that this kind of work constitutes a side line which, prosecuted with enterprise and intelligence, yields quite a handsome profit, while also paving the way for business in other directions and giving the merchant a reputation for alertness and progressiveness.

Supplementing these advices we have heard from two other manufacturers in corroboration of the views expressed. One of these letters is from a well-known manufacturer of both metal and wood Screens, who writes as follows:

We note with pleasure your efforts in reference to Hardware dealers handling made to order Screen work. It is entirely practical and is advantageous to retail Hardware dealers to handle made to order Screens. Many Hardware dealers, however, do not know or understand fine Screen work, and through this lack of information do not appreciate what the work actually is or the advantage it might be to them. For example, we frequently send out high grade Screen Doors the retail value of which is from \$30 to \$50 each. Such work is of expensive wood nicely finished, rustless Wire Cloth,

### High Grade Screen Doors

which is also frequently protected by finely finished metal Grilles, together with genuine bronze Hardware, the latter being the only item that many Hardware dealers know of in connection with fine Screen Doors, and it is safe to assume that many dealers have never considered that Screen Doors could be and often are made to correspond in all materials with the expensive House Doors. The same remarks apply in lesser degree to Window Screens. While Screens are usually a wooden article, they seem to fit into a Hardware store very nicely. This is particularly true of metal Screens.

There are several items that influence the cost which should be taken into consideration. Dealers' facilities for drayage would cut this cost to a minimum. They are usually of sufficient financial worth to buy at the lowest market quotations and to discount their bills. Being locally established and employing salesmen that would otherwise be idle a portion of the time, it is a saving on some of the cost, which of course is equivalent to saving profit, there being no traveling expenses nor hotel bills. We think Hardware dealers are in position to

### Merchants' Advantages

handle Screen work with considerably less margin of profit than traveling salesmen or local salesmen. It costs little if any more to figure Screen work in connection with Mantels, plumbing, heating, Hardware and other details on which they usually figure. We judge ordinarily that clerks that are competent to do such figuring would be competent to handle Screen work. While there are many manufacturers of cheaper grades of wood Screens, there are but very few that make the highest grade, and the dealer should be careful to make his investigation and arrange with the manufacturer who has the facilities to furnish a high grade of work.

### Early in the Season

Such a line of work must be taken up early in the season, as many contracts are let in the fall and winter for spring delivery. There are also very few manufacturers that furnish both metal and wood Screens, and as the metal Screens are rapidly coming into use in the highest grade buildings this should be taken into consideration. High grade Screen contracts usually are for the entire building and run into hundreds and even thousands of dollars.

From the other letter, which is from a manufacturer who has had many years' relations with the Hardware trade in this line, we make the following extract:

We have catered largely to the Hardware trade in the Middle and Western States for many years in special

Screens made from sizes furnished by architects or carpenters. In very few cases has it been necessary for us to trade direct with the consumers, and these were cases where we had no one nearer

### Money in It for the Merchant

to them than ourselves that we could furnish the article through. The field is a good one and we believe that no Hardware merchant handling Screen Doors can make any more money with as small an investment than he can on the straight order business for Screens.

## EXPERIENCE OF HARDWAREMEN.

We also present the following brief extracts from letters from Hardware merchants who have had experience in this field, in which satisfaction is expressed with the working of this side line:

### Helps to Sell Other Goods.

*From an Indiana Merchant:* We have been selling Screens made to order for the last four years and have found same very successful. We look after every new house built and try to get orders for the best quality, and if we can land them with good doors and windows we are pretty sure to sell other goods. We advise any good dealer to try this plan. We are sure he will find it profitable.

### More Satisfactory than Builders' Hardware.

*From a Merchant in Illinois:* In regard to Hardware merchants enlarging their business by supplying Screens made to order, would say that I have been working that line for several years and find it very satisfactory. It takes less time, affords a better profit and gives less trouble than the sale of Builders' Hardware. I believe it can be handled by the Hardware merchant without additional expense. Agitate it. It's a good thing. Push it along.

### One Man for Builders' Hardware, Awnings and Screens.

*From Merchants in Kentucky:* We have been handling made to order Screen Windows and Doors for the past ten years. We have one man who looks after this made to order Screen business, Awning business and Builders' Hardware, which keeps him busy all of the time. As we see it, Hardware merchants can and do take on more lines than any other class of merchants in existence to-day.

### Canvassing Surrounding Towns.

*From a Merchant in Ohio:* We have been in this line for six or eight years and find it helps out trade more or less. The past two seasons we have put a man out in surrounding towns and have disposed of nearly \$2000 worth of Screens each season.

## WHEELING CORRUGATING COMPANY'S NEW CATALOGUE.

**W**HHEELING CORRUGATING COMPANY, Wheeling, W. Va., New York office 47 Cliff street, has just issued a comprehensive illustrated catalogue of 91 pages, containing large assortments of Steel Roofings, Galvanized Tubs and Buckets, Terne, Bright, Coke and Charcoal Plates, Galvanized and Black Sheets, Long Terne Sheets, Zinc and Copper Sheets, Painted and Galvanized Steel and Iron Roofings and Sidings, Roll Tin Roofings, Valleys and Gutters, Eaves Troughs, Conductor Pipe and Fittings and Ridge Roll. Other products shown are Nested and Riveted Stove Pipe and Elbows, Steel Lath, Ferris Hearth Beds and Tin and Galvanized Shingles. Many other goods, including attractive ceiling designs, are illustrated and some helpful tables given.

Milton Morton, Cleveland, Ohio, has retired from the Hardware field, having disposed of his business to the Morton-Petitt Company, of which W. C. Morton is president and M. C. Petitt, treasurer. The business will be continued at the same location in which Milton Morton conducted it for 38 years. The new company will make a specialty of Mill Supplies, situated, as it is, in one of the most extensive shop districts in the country.



# TRADE WINNING METHODS.

*This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.*

## SUPPLYING SPRING NEEDS.

THE larger of the two advertisements reproduced herewith, both reduced about one-third, is what Mr. Walter, the remainder of whose address is South Milwaukee, Wis., calls a "special." An ad. of this general character is run every week, the goods of which mention is made being at the same time attractively displayed in the show window with prices attached. A neat card is also used to call attention to the low prices and the fact that the goods are exactly as advertised and represented.

The smaller ad. is a specimen of those used each week to attract public notice to some particular line that may be in season. Just now Mr. Walter is hammering away on Lawn Mowers, Garden Hose, Gasoline Stoves, &c. "Keeping everlastingly at it" is the idea which this enterprising and aggressive Hardwareman tries to live up to.



**TOOLS**  
**For Every Purpose.**

From the highest grade, demanded by the experienced mechanic, down to the cheaper sorts, for the man who wants to do odd jobs around the house.

Whatever your needs, you will find the largest assortment at this store—at prices just a little bit less than you would pay elsewhere.

The reason—we buy more tools than a half dozen small stores put together. We save in buying and give our customers the benefit.

Glad to "show you" any time.

**BYRON E. WALTER**  
The Leading Hardware Store  
900 Milwaukee Avenue.

## ANOTHER CRITICISM ON RETAILER'S ADVERTISEMENT.

IN our last issue we reproduced an advertisement of the Manchester Hardware Company, Manchester, N. H., which had been submitted to us for criticism. We

also presented opinions of the ad. entertained by two gentlemen well qualified by experience to analyze it. We have since received another criticism from an equally responsible source, in which the advertisement is also commented upon as follows:

My interest was caught by the ad. when I first saw it, and that fact alone I reasoned goes a long way in its favor. When an advertisement arrests attention it has accomplished one great part of its mission.

I think it would be a good point to have the name of the city and the exact street address appear in the announcement. It is likely that the Manchester Hardware Company is well known in the community covered by its advertisements, and therefore its management feels that the line, "48 years near the City Hall," is sufficiently explicit in this respect, but, nevertheless, there may be new residents coming into this community, or there may be a certain amount of transient trade which will be attracted by the advertisement, and will necessarily need to be informed as to the exact location of the store.

In advertising Refrigerators I have found that it often pays better to select one special size—sometimes a small one at a very moderate price—and advertise it with an accurate illustration, instead of endeavoring to speak of the entire line collectively. It is wise to publish the exact dimensions of the Refrigerator spoken of in the ad. in order that the people will not expect a large size at your lowest price when they reach your store. Newspaper pictures of Refrigerators convey to the reader no idea as to size, and therefore this point should be as carefully covered in the text as the construction, ventilation, &c. There is plenty of room beside the cut of the Bread Mixer to tell

**Tell More About Them.** more about that article. The words standing there should have been moved

up and used for a headline. This should have been followed by a terse description of the mixer, naming the quality of tin of which it is made, the work it will do and the labor and time it will save. In the Shovel, Hoe and Rake item it will pay to make more emphatic the fact that all the three implements were offered for \$1.25. This could be accomplished by the use of a headline or by cutting the dollar sign out of the price and running the item in narrower measure, with a brace and the price at the right. This would leave plenty of white space above the figures, in which might be placed the words, "Combination of Three Implements for." These words should run in small, heavy face type to contrast with the type used in the item. The criticism made of the Bread Mixer might also be applied to the Cobbling Sets, Baseball Outfits and the Cameras. They are all too general. People should be told how many pieces there are in the Cobbling Set, how well they are made and how easy they are to manipulate.

**Far Above the Average** Ball players would rather have an accurate description of one outfit than a general mention of a whole line. It is easy to put in a bold display line if you wish to call attention to other goods in general. This announcement is far above the average of the local Hardware store, and, while it might be improved in many minor ways, such as those outlined, it still shows a tendency in the right direction and for that reason should be commended.

## MANUFACTURERS HELPING RETAIL MERCHANTS.

WE recently referred editorially to the tendency on the part of manufacturers to aid retail merchants in selling their goods. The way in which they do this finds many illustrations in the trade. For example, Miller Lock Company, Philadelphia, is offering what it calls Padlock card assortments, by means of which the goods are attractively displayed, and as each Lock is sold it can be conveniently replaced.

Sidney Shepard & Co., Buffalo, N. Y., issue handsome cards for hanging in the store, a circular supplying in-

### Spring Needs for the Garden and Home Use.

These items are neither baits nor mysteries. They are priced at the lowest figure reliable merchandise can be sold for, and careful buyers will see the money saving chances.

- Malleable Garden Rakes, 12 tooth,**  
braced, long hardwood handle, the good kind .....20c  
**Garden Trowels, solid steel blade, black enameled handle...** 30c  
**Garden Spades, all steel hardwood D handle.....** 30c  
**Garden Hoes, steel blade riveted to shank, hardwood handle...** 20c  
**Galvanized Poultry Wire, 2 inch mesh, 3/4 c a square foot, by the roll.....** 1/2c  
**Lawn Rakes, 21 inches wide, heavy uncoed steel, long handle.....** 40c  
**Steel Shovels, solid back, hardwood D handle, 50c value.....** 40c  
**Wire Carpet Beaters, good size, well made, 20c sort.....** 15c

**45c 45c 45c 45c**

A big lot of spading forks, with 4 all steel tines and iron D grip handle. They'll go in a hurry at

**45c 45c 45c 45c**

- Rattan Carpet Beaters, the heavy three strand kind worth 25c.....** 20c  
**Window Brushes, large size, selected fibre, with pole.....** 35c  
**Flat Varnish Brushes, 1 inch wide, white bristles.....** 5c  
**Perforated Chair Seats, 3-ply veneer, too prevent warping.....** 5c  
**Galvanized Water Pails, heavy metal, strong bail.....** 15c  
**Pine Step Ladders, 5 foot, made of selected lumber, well braced...** 50c  
**Mixed Paints, ready for use, gallon \$1.20, 1/2 gallon 65c, quart 35c, 1/2 pint.....** 15c  
**Gasoline Stoves, 2 burner, brass valves, safety tank, braced top, closed ends: \$2.50 value.....** \$2.00  
**Blue Flame Oil Stoves, 2 burner, wickless, \$5.00 value.....** \$4.00

**White Wash Brushes, selected fibre, metal bound at.....** 25c

**BYRON E. WALTER**  
The Leading Hardware Store  
900 Milwaukee Avenue.

formation as to how to conduct demonstrations of the company's products, advertising cuts, &c.

The White Mountain Refrigerator Company, Nashua, N. H., get up a varied line of advertising for this purpose, including catalogues, booklets, cards, hangers, electrotypes for use in local papers, &c.

The Dover Mfg. Company, Canal Dover, Ohio, is prepared to supply a great variety of publicity matter for the asking in the interest of its well-known Asbestos Sad Irons.

The Yale & Towne Mfg. Company, New York, issue a variety of booklets, one, for example, illustrating various styles of its Padlocks and circulars of its Blount Door Check, as well as entertaining skits, one of which is entitled the "Peacemakers."

The Pike Mfg. Company, Pike, N. H., get out a variety of literature, one of the best of the issues relating to its lines being "Oil Stones; How to Select and Use Them," which with the illustrations give valuable matter to the mechanic, as well as to the ambitious and enterprising Hardwareman, proprietor or clerk, who is anxious to know more than the name and price of an article or the buyer's address. The various cabinet assortments of Sharpening Stones for water and oil and Scythe Stones just put on the market is another method of helping the merchant to dispose of the company's goods.

Landers, Frary & Clark, New Britain, Conn., advertise their Bread Mixer widely and have in some cases employed women demonstrators to instruct housewives in prominent stores, where they can best be reached.

The Tabor Sash Company, Newark, N. J., recently issued a hanger of diagrammatic working plans to show exactly how to hang the ten styles of its Sash, so that the workman knows exactly how to do it.

While all these enterprises, carried out at great outlay of thought, time and money, are primarily for the benefit of the manufacturer, nevertheless the merchant who is keeping abreast of the period finds it easier to sell an article well displayed and attractively described. There is evidently a tendency on the part of manufacturers thus to aid the merchants in disposing of their goods, and the effort is to be commended most heartily.

## GOING THEM ONE BETTER.

**T**HOMPSON & CO., general Hardware merchants, Mt. Jewett, Pa., have recently issued a circular in which they address their patrons on the subject of retail catalogue house competition. In it a definite offer is made to meet the prices of catalogue houses and even to undersell them in some cases by supplying goods of better quality at the same price. Where a stipulated quantity of goods is purchased they offer to save their customers an amount in cash equal to the freight they would have to pay if the goods were ordered from the mail order houses. We make the following extracts from this aggressive circular, which is headed

### A FAIR PROPOSITION.

#### To Our Patrons.

And especially to those who are thinking of sending to the catalogue houses for goods in our line, we wish to make this offer: Bring in your list, and we will sell you the same or better goods at their prices, for cash, same as they—yes, we will go them one better—we will save you the freight on all bills purchased at one time amounting to \$5 or more and weighing not over 200 pounds. You can bring your catalogue with you if you wish, but it will not be necessary, as we have all their catalogues on file in our office and know their prices.

Give us a trial. We feel certain we can convince you that we can serve you better than the catalogue people, not only in price but in quality, which is remembered long after the price is forgotten, to say nothing of the satisfaction of seeing the goods you are buying as well as being able to get matters adjusted promptly when anything is wrong.

We keep constantly on hand a large assortment of all goods usually kept in a first-class Hardware store, including Household Goods, Farm Implements, Wagons, Buggies, Paints, &c., and if we do not have what you want in stock will send to our wholesale houses and get it for you at catalogue house prices.

The catalogue house furnishes no market for the farmer's products, pays no taxes, supports no schools or

churches, and gives nothing to the poor in your community. At even prices are we not entitled to your trade?

We are not making you this offer for mere buncombe, but have considered the matter carefully and are prepared to do exactly as we offer. We are offering better than the catalogue houses. Will you give us a trial?

You owe it to the best interests of the community in which you live, you owe it to the best interests of yourself (and we think you owe it to us) to do this. Will you do it?

## POINTERS FOR HARDWAREMEN.

BY ON-THE-ROAD.

**I** WAS sitting in a large Hardware store one morning when the proprietor of the business came in. He was a middle aged gentleman of dignified bearing, but very genial when one came to know him. He was a very successful man, having built up a lucrative business from a small beginning, almost entirely through his own efforts. On this particular morning the fact was very evident that he shaved himself. There was a great piece of court plaster pasted in a picturesque, slanting fashion across his cheek, but that is not the important point for clerks, who will please note that he was a very successful man—and that he shaved himself. Some one questioned him about the cut on his cheek and his quick reply was: "Keep your mind on your shaving and you won't get cut." This was not meant as a rebuff, as was obvious when the proprietor continued:

### Why He Cut Himself

"I have shaved myself for years and very seldom get cut. That's because when I am shaving I compel myself to think about the shaving and nothing else. This morning I deviated from the rule and I got the cut—a good deep gash that will take a couple of weeks to heal! It's the same way in business. Keep your mind on what you are doing and you will get it done quickly and well. Keep your mind on your business and you will succeed."

The trouble nowadays is there are too many distractions for business men and clerks. Good wholesome recreation is all right, but there's a whole lot of tomfoolery and frivolity masquerading around under the heading of recreation, and it's the cause of more failures among merchants and clerks than anything else I know of.

Scattered efforts don't count. What you need is concentration. The "home man" is the success these days. The "good fellow" is the failure. The first seeks healthful and uplifting diversions; the second goes in for recreation that is nothing but distraction. The first concentrates his energies upon something which will help him to concentrate his efforts upon his business the next day. The second don't know the meaning of concentration, and

### Value of Concentration

is looking only for a "good time." Concentration is an important word in business, but you cannot define it or put it into practice unless you keep your heads clear and your bodies and nerves in good shape. The men who get results—who can do things—are the men the business world wants to-day, and they are the future merchant princes.

No Hardwareman whose sanity or common sense is beyond question would try to sell goods by making a statement and then monotonously repeating it *verbatim* many times. Yet that is the position taken by an advertiser who permits his announcement to run week after week without alteration. By all means change your copy and say something fresh—the oftener the more effective.

Your permanently successful merchant does not misrepresent the quality of his goods. Neither does he misrepresent quantity when making a special drive on a certain article or line. To illustrate: Suppose he advertises a staple article at a price which is sure to create a large demand for it. He should see to it that there is a sufficient supply of the goods on hand to accommodate



customers for a reasonable period of time at least. Sometimes a merchant uses as a leader some article of which there is a scant stock, just a few to supply the early birds. This doesn't pay, as customers are apt to be disappointed when told that they are too late to secure the offered bargain, and if the thing happens too frequently the store must expect to lose some of its friends. Merchants sometimes explicitly specify the number or quantity of these under priced goods which are included in the sale. This is a fair proposition and simply puts it up to the customer to act promptly if he desires to avail himself of the offer.

Nothing helps a town and its merchants more than the emphatically expressed belief that you are living in a wide awake, much to be envied community. Don't "knock" the scene of your toils and labors, even though the resulting measure of success may not be as large as hoped for. A little optimism in regard to the features and advantages of your town will accomplish much in its behalf. Every merchant should regard it a duty to keep his town to the front at all times, and this public spirit will often result in bringing about needed reforms and improvements, elevating the tone and character of its people.

One of my customers who is very enterprising and ingenious in his advertising methods encloses a red slip in every package leaving his store, reading as follows:

#### SPECIAL REQUEST.

1. Are you pleased with this purchase?
2. Is it just as represented?
3. Did you get your money's worth?

If your answer to any of the above queries is NO it will be a special favor to me if you will call the matter to my attention when you next have occasion to visit the store; or if the dissatisfaction is acute please come in at once.

I am using my best endeavors to run this store right, and want to correct any faults in the service that may come up.

Thanking you for this and other favors, and soliciting your continued patronage, I am, &c.,

CUSTOMER'S NAME AND ADDRESS.

This store is so carefully and skillfully conducted that its "faults" are few and far between, and very little is heard in criticism of the treatment accorded customers. There is no doubt, however, that the invitation to pick flaws in the service is appreciated by its customers and is good advertising.

A Hardware merchant who handles a very wide variety of merchandise, including Clocks, recently put a handsome Clock in his window bearing the following card:

#### A Clock for a Guess.

This eight-day Clock was wound March 20, at 7.30 a.m.

When will it run down?

The Clock will be awarded to the person making the nearest guess.

The Clock occupied a conspicuous place in the window, being mounted on a pedestal. Each sale of 25 cents or more entitled the purchaser to a ticket on which provision was made for entering his name and the time when he thought the Clock would run itself out. The scheme attracted a good deal of attention from the public, and enough additional trade was secured to pay for the Clock.

Several of my customers have arranged with the publishers of the local papers to receive brief advices in re-

gard to the day's important events throughout the country and abroad as they come over the wires. These advices in the form of bulletins are posted conspicuously in the store front, either in the show windows or on a small blackboard designed for this purpose. The cost of this service is only nominal, and in some cases where the firm is a large advertiser in the paper furnishing the news no charge is made. The bulletins are always sure to attract the attention of passersby.

One of my merchant friends in a small town became dissatisfied with the typographical presentation of his ad. in the local paper. The publisher's assortment of type and borders was rather limited, with the result that there was a good deal of sameness in the appearance of the announcements of the various advertisers. My friend accordingly purchased a few fonts of display type that differed materially from those carried by the printer, and with several new and attractive borders his ads. quickly caught the eye and secured the attention of the reader by reason of the individuality which characterized them.

### THE CLARK-HORROCKS COMPANY.

CLARK-HORROCKS COMPANY, Fishing Rod manufacturer, Utica, N. Y., has purchased the plant and Fishing Tackle business of Gillette Bros., Auburn, N. Y. By this purchase the company is enabled to largely increase its manufacturing line. Gillette Bros. three years ago succeeded another concern that had been engaged 15 years in making Fishing Tackle, Trolling Spoons, Spoon Bait, Frog Spears and other specialties in the Tackle line. The Clark-Horrocks Company is now moving the business to Utica, where it will be continued. The line will be somewhat enlarged, although at present there are something over 140 different styles of Trolling Spoons made by this company. By the purchase of this well equipped plant the Clark-Horrocks Company has strengthened its line of Fishing Tackle. The company for some years has been making Fishing Rods, Artificial Flies and other specialties, and does a large business throughout the country and abroad. The material used in the manufacture of its Rods comes from a great distance, bamboo being imported from Japan and India, Lancewood from Cuba and Greenhart from Brazil. The officers of the company are: G. A. Clark, president; H. J. Horrocks, vice-president; J. H. Horrocks, treasurer, and E. D. Ibbotson, secretary.

### GRAY & DUDLEY HARDWARE COMPANY TO MANUFACTURE HARDWARE.

GRAY & DUDLEY HARDWARE COMPANY, Nashville, Tenn., has completed arrangements to erect and operate a foundry and Hardware manufacturing plant in that city. A site containing about 11 acres has been purchased and it is expected to have the entire plant in operation by September 1. The company will manufacture quite a varied line of Hardware and Cast Iron Goods, including Anvils, Hammers, Hinges, Butts, Sash Weights, Stove Hollow Ware, Well Wheels, Grindstone Fixtures, Gate Latches, Blind Hinges, Hitching Weights, Hay Fork Pulleys and Stoves. Eventually it expects to make other lines, such as Lawn Mowers, Ice Cream Freezers, Builders' Hardware, Edge Tools, &c. The company is now and has for several years been making Harness, Saddlery, &c.

C. MORGAN'S SONS, wholesale and retail merchants, Wilkes-Barre, Pa., have purchased the Hardware business at Pittston, Pa., which for the past 40 years has been conducted by S. P. Fenn, and will continue it as a branch house. The store has been entirely remodeled, new shelving, windows, &c., being installed, and has been brought up to date in all its appointments. The stock has been materially increased both in volume and assortment.

## AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION.

**T**HE AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION is an organization composed exclusively of manufacturers whose product is sold to the Hardware trade. The association was organized October 9, 1901. The annual meeting is held the third Wednesday in November, the date being contemporaneous with the annual convention of the National Hardware Association. The American Hardware Manufacturers' Association also meets simultaneously with the Southern Hardware Jobbers' Association, whose annual meeting is held in June of each year, the next assemblage being at Hot Springs, Va., June 6-9.

Inasmuch as the output of this group of manufacturers goes mainly to the Hardware trade, it has been found advantageous to the manufacturers to get in contact with the leading jobbers of the country at least twice a year. By holding its meetings as indicated above it becomes convenient for the manufacturers to meet the heads and buyers of the various jobbing houses, thus developing and cementing personal ties, to mutual advantage.

The object of the association as embodied in its constitution is "to further the interests of the manufacturers and promote cordial relations with the distributors." Many important trade questions have already received the considerate and careful attention of the manufacturers, such as abuse of cash discounts, cancellations of contracts, payment for representation in jobbers' catalogues, packing and shipping of small lots of goods direct to customers in other than regular packages, &c., which for years had been a source of much worry and embarrassment to them. The association has also accomplished something in the way of more favorable railroad classification on some goods, illustrating the value of united effort, as the manufacturers as individuals had for years been clamoring for relief in this direction, only to meet with successful rebuffs.

### Special Brands

is another question which has received much consideration at the hands of the association, and it is quite likely to be further ventilated at the Hot Springs meeting. Manufacturers with few exceptions are opposed to the private branding of goods, some of them, indeed, having for years declined absolutely to accept orders involving the omission of the manufacturer's name either on the goods or labels. Notwithstanding the antagonistic sentiment of manufacturers the special brand abuse has grown and developed until it has become a question of very grave importance with many makers, who are confronted with the entire loss of identity with their product if a radical and firm stand is not taken against the practice. It is not unlikely that the association will make some effort to minimize the evils which are identified with the custom.

### Officers and Committees.

The officers of the association are as follows:

**PRESIDENT**, Julius C. Birge, St. Louis Shovel Company, St. Louis, Mo.

**VICE-PRESIDENTS**: George W. Corbin, Corbin Cabinet Lock Company, New Britain, Conn.; Henry B. Lupton, Oliver Iron & Steel Company, Pittsburgh, Pa.; C. W. Asbury, Enterprise Mfg. Company, Philadelphia, Pa.

**SECRETARY-TREASURER**, F. D. Mitchell, 309 Broadway, New York.

The chairman of the Executive Committee is George P. Hart of the Stanley Works, New Britain, Conn. Associated with Mr. Hart are the following gentlemen: Wm. M. Pratt, Goodell-Pratt Company, Greenfield, Mass.; E. G. Buckwell, Cleveland Twist Drill Company, Cleveland, Ohio; E. B. Pike, Pike Mfg. Company, Pike, N. H.; Samuel Disston, Henry Disston & Sons, Philadelphia, Pa.; W. M. Taussig, Challenge Cutlery Corporation, New York City; Wm. H. Hays, Iron City Tool Works, Pittsburgh, Pa.; John E. Harbster, Reading Hardware Company, Reading, Pa., and the president and vice-presidents, *ex-officio*.

The Membership Committee has for its chairman Edward Ingalls of the Atha Tool Company, Newark, N. J., whose associates are George P. Hart, the Stanley Works,

New Britain, Conn.; George H. Bishop, George H. Bishop & Co., Lawrenceburg, Ind.; Fred. S. Merrick, Standard Horse Nail Company, New Brighton, Pa.; Chalmers M. King, McKinney Mfg. Company, Allegheny, Pa.; D. W. Simpson, Wilcox Mfg. Company, Aurora, Ill.; Edward Kemp, Wabash Screen Door Company, Chicago, Ill.; E. G. Buckwell, Cleveland Twist Drill Company, Cleveland, Ohio, and E. E. Perry, Hopkins & Allen Arms Company, Norwich, Conn.

Another important committee is that on freight, the chairman of which is E. B. Pike of the Pike Mfg. Company, Pike, N. H. Mr. Pike has given much time and attention to this subject and will read a paper on it at the Hot Springs convention. The other members of the freight committee are: Henry B. Lupton, Oliver Iron & Steel Company, Pittsburgh, Pa.; C. W. Asbury, Enterprise Mfg. Company, Philadelphia, Pa.; N. A. Gladding, E. C. Atkins & Co., Indianapolis, Ind.; Edwin A. Walton, the Bronson-Walton Company, Cleveland, Ohio; D. H. Goodell, Goodell Company, Antrim, N. H.; F. A. Alexander, Yale & Towne Mfg. Company, New York.

### Membership.

The membership of the association at present numbers 225 concerns, whose names are given herewith. It will be observed that among them are many of the largest and most progressive producers of Hardware in the country, representing every branch of the trade. While it is not thought advisable to increase the membership beyond a certain limit, further accessions of manufacturers of standing and position in the trade will doubtless be welcomed by the officers. The annual association dues are \$25. Following is the list of members:

American Steel & Wire Company, Chicago, Ill.  
American Iron & Steel Mfg. Company, Lebanon, Pa.  
American Sheet & Tin Plate Company, New York City.  
American Axe & Tool Company, Glassport, Pa.  
American Fork & Hoe Company, Cleveland, Ohio.  
American Screw Company, Providence, R. I.  
American Stove Company, St. Louis, Mo.  
American Horse Shoe Company, Phillipsburg, N. J.  
American Cutlery Company, Chicago, Ill.  
American Wringer Company, New York City.  
American Shear & Knife Company, Hotchkissville, Conn.  
American Shearer Mfg. Company, Nashua, N. H.  
Ames Shovel & Tool Company, Boston, Mass.  
E. C. Atkins & Co., Indianapolis, Ind.  
Atha Tool Company, Newark, N. J.  
Avery Stamping Company, Cleveland, Ohio.  
Atlantic Screw Works, Hartford, Conn.  
G. & H. Barnett Company, Philadelphia, Pa.  
Baeder, Adamson & Co., Philadelphia, Pa.  
Wallace Barnes Company, Bristol, Conn.  
Bissell Carpet Sweeper Company, Grand Rapids, Mich.  
Belfont Iron Works Company, Ironton, Ohio.  
Belding-Hall Mfg. Company, 196 Monroe street, Chicago, Ill.  
Berger Mfg. Company, Canton, Ohio.  
Bemis & Call Hardware & Tool Company, Springfield, Mass.  
Bromwell Brush & Wire Goods Company, Cincinnati, Ohio.  
Bommer Brothers, Brooklyn, N. Y.  
Bullard Automatic Wrench Company, Providence, R. I.  
Boss Washing Machine Company, Cincinnati, Ohio.  
George H. Bishop & Co., Lawrenceburg, Ind.  
Boston & Lockport Block Company, Boston, Mass.  
Bridgeport Chain Company, Bridgeport, Conn.  
Bronson-Walton Company, Cleveland, Ohio.  
E. & G. Brooke Iron Company, Birdsboro, Pa.  
Bryden Horse Shoe Company, Catasauqua, Pa.  
Buffalo Bolt Company, Buffalo, N. Y.  
Berbecker & Rowland Mfg. Company, Waterbury, Conn.  
Carnegie Steel Company, Pittsburgh, Pa.  
Cambria Steel Company, Philadelphia, Pa.  
Crucible Steel Company of America, Pittsburgh, Pa.  
John Chatillon & Sons, New York City.  
Clyde Cutlery Company, Clyde, Ohio.  
Henry Cheney Hammer Company, Little Falls, N. Y.  
Chicago Spring Butt Company, Chicago, Ill.  
Cleveland Hardware Company, Cleveland, Ohio.  
Continental Tool Company, Frankfort, N. Y.  
Camillus Cutlery Company, Camillus, N. Y.  
Cleveland Stone Company, Cleveland, Ohio.  
Cleveland Twist Drill Company, Cleveland, Ohio.  
Cleveland Wire Spring Company, Cleveland, Ohio.  
Chantrell Tool Company, Reading, Pa.  
Columbus Chain Company, Columbus, Ohio.  
Columbian Hardware Company, Cleveland, Ohio.  
Clinton Wire Cloth Company, Clinton, Mass.  
Clayton & Lambert Mfg. Company, Detroit, Mich.  
Challenge Cutlery Corporation, Bridgeport, Conn.  
P. & F. Corbin, New Britain, Conn.  
Corbin Screw Corporation, New Britain, Conn.  
Corbin Cabinet Lock Company, New Britain, Conn.  
Chapin-Stephens Company, Pine Meadow, Conn.



Cronk & Carrier Mfg. Company, Elmira, N. Y.  
 Daisy Mfg. Company, Plymouth, Mich.  
 Thomas Devlin Mfg. Company, Philadelphia, Pa.  
 E. I. Du Pont Company, Wilmington, Del.  
 Dana Mfg. Company, Cincinnati, Ohio.  
 W. H. Davenport Fire Arms Company, Norwich, Conn.  
 Dwight Divine & Son, Ellenville, N. Y.  
 Henry Disston & Sons, Philadelphia, Pa.  
 S. R. Droscher, 79 Warren street, New York City.  
 Dover Mfg. Company, Canal Dover, Ohio.  
 N. R. Davis & Sons, Assonet, Mass.  
 Diamond State Steel Company, Wilmington, Del.  
 Eagle Lock Company, New York City.  
 Enterprise Mfg. Company, Philadelphia, Pa.  
 Empire Knife Company, West Winsted, Conn.  
 Evansville Tool Works, Evansville, Ind.  
 E. T. Fraim, Lancaster, Pa.  
 Frictionless Metal Company, Richmond, Va.  
 Fremont Razor Strop Company, Fremont, Ohio.  
 Ferrosteel Company, Cleveland, Ohio.  
 Garland Nut & Rivet Company, Pittsburgh, Pa.  
 Greene, Tweed & Co., New York City.  
 Graham Nut Company, Pittsburgh, Pa.  
 Goodell Company, Antrim, N. H.  
 Goodell-Pratt Company, Greenfield, Mass.  
 Grafton Stone Company, Elyria, Ohio.  
 Griffin Mfg. Company, Erie, Pa.  
 Harrington & Richardson Arms Company, Worcester, Mass.  
 Hazel-Atlas Glass Company, Wheeling, W. Va.  
 Hamilton Rifle Company, Plymouth, Mich.  
 Hart & Cooley Company, New Britain, Conn.  
 Heller Brothers Company, Newark, N. J.  
 Hero Fruit Jar Company, Philadelphia.  
 Hubbard & Co., Pittsburgh, Pa.  
 Hopkins & Allen Arms Company, Norwich, Conn.  
 Hurwood Mfg. Company, Bridgeport, Conn.  
 Hussey-Bluns Shovel Company, Pittsburgh, Pa.  
 Hoyt Metal Company, St. Louis, Mo.  
 Humason & Beckley Mfg. Company, New Britain, Conn.  
 Hunter Arms Company, Fulton, N. Y.  
 International Cutlery Company, Fremont, Ohio.  
 Iron City Tool Works, Pittsburgh, Pa.  
 Irwin Auger Bit Company, Wilmington, Ohio.  
 Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.  
 Jones & Laughlin Steel Company, Pittsburgh, Pa.  
 Kelly Axe Mfg. Company, Alexandria, Ind.  
 Kelly Nail & Iron Company, Ironton, Ohio.  
 Keuffel & Esser Company, New York City.  
 Keystone Mfg. Company, Buffalo, N. Y.  
 Kampfe Bros., New York City.  
 Kilbourne & Jacobs Mfg. Company, Columbus, Ohio.  
 Kirk-Latty Mfg. Company, Cleveland, Ohio.  
 Klein-Logan Company, Pittsburgh, Pa.  
 George W. Korn Razor Mfg. Company, Little Valley, N. Y.  
 Keasbey & Mattison Company, Ambler, Pa.  
 Lake Erie Iron Company, Cleveland, Ohio.  
 Lalanc & Grosjean Mfg. Company, New York City.  
 Lamson & Goodnow Mfg. Company, Shelburne Falls, Mass.  
 Lamson & Sessions Company, Cleveland, Ohio.  
 Lockwood Mfg. Company, South Norwalk, Conn.  
 Lawson Mfg. Company, 40 Dearborn street, Chicago, Ill.  
 Landers, Frary & Clark, New Britain, Conn.  
 Lovell Mfg. Company, Erie, Pa.  
 Ludlow-Saylor Wire Company, St. Louis, Mo.  
 Lufkin Rule Company, Saginaw, Mich.  
 Lunkenheimer Company, Cincinnati, Ohio.  
 McCabe Hanger Company, New York City.  
 Mann Edge Tool Company, Lewistown, Pa.  
 McCaffrey File Company, Philadelphia, Pa.  
 David Maydole Hammer Company, Norwich, N. Y.  
 H. H. Mayhew Company, Shelburne Falls, Mass.  
 Mayer & Co., Philadelphia, Pa.  
 McKinney Mfg. Company, Allegheny, Pa.  
 Meriden Cutlery Company, Meriden, Conn.  
 Fred. J. Meyers Mfg. Company, Hamilton, Ohio.  
 Mack & Co., Rochester, N. Y.  
 Miller Lock Company, Philadelphia, Pa.  
 Millers Falls Company, New York City.  
 Miller Bros. Cutlery Company, Meriden, Conn.  
 Charles Morrill, New York City.  
 National-Acme Mfg. Company, Cleveland, Ohio.  
 National Screw & Tack Company, Cleveland, Ohio.  
 National Sewing Machine Company, Belvidere, Ill.  
 National Sweeper Company, Marion, Ind.  
 Never Slip Mfg. Company, New Brunswick, N. J.  
 National Supply Company, Baltimore, Md.  
 New Jersey Wire Cloth Company, Trenton, N. J.  
 Nicholson File Company, Providence, R. I.  
 Nixdorf-Krein Mfg. Company, St. Louis, Mo.  
 North Brothers Mfg. Company, Philadelphia, Pa.  
 National Cutlery Company, Detroit, Mich.  
 Norwalk Lock Company, South Norwalk, Conn.  
 National Enameling & Stamping Company, Baltimore, Md.  
 New York Knife Company, Walden, N. Y.  
 North & Judd Mfg. Company, New Britain, Conn.  
 Norton Tool Company, Cleveland, Ohio.  
 National Brass & Iron Works, Reading, Pa.  
 Ohio Tool Company, Columbus, Ohio.  
 Oliver Iron & Steel Company, Pittsburgh, Pa.  
 Onelda Community, Limited, Kenwood, N. Y.  
 Owosso Mfg. Company, Owosso, Mich.  
 Charles Parker Company, Meriden, Conn.  
 Peters Cartridge Company, Cincinnati, Ohio.

J. C. Pearson Company, Boston, Mass.  
 Pike Mfg. Company, Pike, N. H.  
 Potter Mfg. Company, Geneva, Ohio.  
 Pittsburgh Steel Company, Pittsburgh, Pa.  
 Phoenix Horse Shoe Company, Poughkeepsie, N. Y.  
 Pittsburgh Screw & Bolt Company, Pittsburgh, Pa.  
 Pullman Mfg. Company, Rochester, N. Y.  
 Fayette R. Plumb, Incorporated, Philadelphia, Pa.  
 Reading Hardware Company, Reading, Pa.  
 Reed & Prince Mfg. Company, Worcester, Mass.  
 Simeon L. & George H. Rogers Company, Hartford, Conn.  
 Republic Iron & Steel Company, Chicago, Ill.  
 Reynolds Wire Company, Dixon, Ill.  
 Richmond Cedar Works, Richmond, Va.  
 Romer Axe Company, Dunkirk, N. Y.  
 Rome Mfg. Company, Rome, N. Y.  
 Sharon Steel Hoop Company, Sharon, Pa.  
 Simonds Mfg. Company, Fitchburg, Mass.  
 Standard Chain Company, Pittsburgh, Pa.  
 O. P. Schriver & Co., Cincinnati, Ohio.  
 H. D. Smith & Co., Plantsville, Conn.  
 Standard Horse Nail Company, New Brighton, Pa.  
 Standard Horse Shoe Company, Boston, Mass.  
 Stanley Rule & Level Company, New Britain, Conn.  
 Standard Tool Company, Cleveland, Ohio.  
 Sandusky Tool Company, Sandusky, Ohio.  
 Stanley Works, New Britain, Conn.  
 Southington Cutlery Company, Southington, Conn.  
 J. Stevens Arms & Tool Company, Chicopee Falls, Mass.  
 St. Louis Shovel Company, St. Louis, Mo.  
 Safety Door Hanger Company, Ashland, Ohio.  
 Southern Plow Company, Columbus, Ga.  
 Wm. Schollhorn Company, New Haven, Conn.  
 Tobin Arms Mfg. Company, Norwich, Conn.  
 C. C. & E. P. Townsend, New Brighton, Pa.  
 Troy Nickel Works, Albany, N. Y.  
 Tubular Rivet & Stud Company, Boston, Mass.  
 Tucker & Dorsey Mfg. Company, Indianapolis, Ind.  
 United States Stamping Company, Moundsville, W. Va.  
 U. S. Hame Company, Buffalo, N. Y.  
 Upson Nut Company, Cleveland, Ohio.  
 Van Wagoner Company, Cleveland, Ohio.  
 Wm. Vogel & Bros., Brooklyn, N. Y.  
 Wallingford Mfg. Company, Wallingford, Vt.  
 Wabash Screen Door Company, Chicago, Ill.  
 Warren Axe & Tool Company, Warren, Pa.  
 J. D. Warren Mfg. Company, Chicago, Ill.  
 Wyoming Shovel Works, Wyoming, Pa.  
 Walden Knife Company, Walden, N. Y.  
 Williams Bros. Mfg. Company, Glastonbury, Conn.  
 Whitman & Barnes Mfg. Company, Chicago, Ill.  
 Samuel Winslow Skate Mfg. Company, Worcester, Mass.  
 Warwood Tool Company, Wheeling, W. Va.  
 Wood Shovel & Tool Company, Piqua, Ohio.  
 Wilcox Mfg. Company, Aurora, Ill.  
 L. & I. J. White Company, Buffalo, N. Y.  
 White Mountain Freezer Company, Nashua, N. H.  
 Yale & Towne Mfg. Company, New York City.  
 Youngstown Iron & Steel Roofing Company, Youngstown, Ohio.

## HONORARY MEMBERS.

George H. Sargent, New York City.  
 Irby Bennett, Memphis, Tenn.

## The Hot Springs Meeting.

The next meeting of the association will be held June 6-9 at the Homestead Hotel, Hot Springs, Va., which is a beautiful place and admirably suited to the purpose of such a gathering. The manufacturers will have several joint sessions with the Southern Hardware Jobbers, and, as is customary, there will be social functions as well as business meetings. It is expected also that at this meeting there will be present representatives of the four largest jobbers in the country, who are not members of any association.

The November meeting will be in Washington, D. C., in conjunction with the National Hardware Association. These meetings will afford an opportunity to meet practically all the Hardware jobbers in the United States, which is at once a pleasure and privilege for the jobber and buyer as well as for the manufacturer.

THE trade will regret to learn of the death of Fred. Hinds of the jobbing Hardware firm of Babcock, Hinds & Underwood, Binghamton, N. Y., on the 5th inst.

IN an announcement of the Hawkeye Wrench Company, Marshalltown, Iowa, which appeared in our last issue the number of the company's patent on the Hawkeye wrench was erroneously given as 72,055, when it should have been 720,554. This is the patent in regard to which the company is cautioning the trade against infringement.

## REQUESTS FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, and are referred to the manufacturers:

FROM ST. LOUIS RIVER LOGGING COMPANY, Cloquet, Minn., which is about to open a house for the handling of all logging supplies at wholesale, and desires catalogues and price-lists relating to this line. The company also handles Hardware, hay, grain, feed, &c.

FROM THE CARLSON-LUSK HARDWARE COMPANY, LIMITED, Boise, Idaho, which has succeeded Coffin-Clinton Hardware Company and Lusk Plumbing & Heating Company in the wholesale and retail business in these lines as well as Mining Machinery, Assay Supplies, &c. The new company has been capitalized at \$100,000.

FROM H. L. HARRINGTON, Fowler, Ind., who has recently opened up in the Shelf and Heavy Hardware, Stove, Paint and Sporting Goods business.

FROM THE BURNQUIST HARDWARE COMPANY, Dayton, Iowa, which has been incorporated with a capital of \$25,000, to carry on the retail business in Shelf and Heavy Hardware, Stoves, Implements, Sporting Goods, Paints, Buggies, Wagons, &c. An additional warehouse, 42 x 48 feet, has just been completed.

FROM J. E. ROBERTS HARDWARE COMPANY, Valdosta, Ga., which desires printed matter relative to Hardware, both Shelf and Heavy, Stoves, Implements, Paints, Sporting Goods, &c.

FROM JAMES E. YOUNG, Lake City, Fla., who is intending to add to his Hardware line such related goods as Stoves, Buggies and Wagons and Farm Machinery, and desires catalogues and quotations relating thereto.

FROM ADDY & McMILLAN—T. F. Addy and A. McMillan—who have lately commenced the Shelf and Heavy Hardware, Stove, Implement, Paint and Sporting Goods business at Grafton, N. D.

FROM C. C. SENG, Clatonia, Neb., in the retail Shelf and Heavy Hardware, Stove and Sporting Goods business.

FROM N. A. SIMMONS, Binger, Okla., who has succeeded Yeoman & Simmons in the Hardware, Stove, Sporting Goods and Implement business. Mr. Simmons has enlarged the store and is carrying more stock than formerly.

FROM THE ALLEN HARDWARE & PLUMBING COMPANY, Arlington, Wash., which has been incorporated with a capital stock of \$6000. The stock carried will also include Stoves, Agricultural Implements and Paints.

FROM BONEBRAKE-HIGHTOWER COMPANY, Altus, Okla., which has increased its capital stock to \$18,000. The company handles Shelf and Heavy Hardware, Stoves, Implements, groceries, &c.

FROM C. J. CAMERON & Co., Liberal, Mo., who have succeeded C. J. Cameron in the Hardware, Stove, Implement, Paint, Buggy and Wagon business. Albert Simms is the new member of the firm.

FROM E. A. HIBBARD & SON, Phelps, N. Y., who are enlarging their quarters and stock, and will be glad to receive catalogues, price-lists, &c., from manufacturers of Hardware, Paints and Oils, House Furnishings, Electrical Goods and suitable novelties.

FROM THE AMERICAN HARDWARE & PLUMBING COMPANY, Manila, P. I., which desires catalogues and best export discounts, delivered, f.o.b. steamer, New York, on Agricultural Implements, a line of which the company has

decided to add to its stock of general Hardware, Plumbing Supplies, Sporting Goods, &c.

FROM T. H. CONNELL & Co., Deep River, Iowa, who have succeeded Icenbloe & Whitney in the Hardware, Stove, Paint and Sporting Goods business.

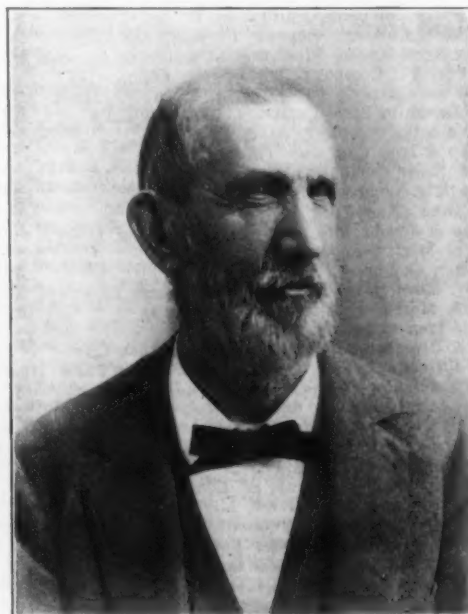
FROM WESTERN HARDWARE COMPANY, Western, Neb., which has purchased the Shelf and Heavy Hardware, Stove, Implement, Paint, Sporting Goods, Harness and furniture business formerly conducted by Hermann Gross.

FROM W. H. DORRANCE & SON, Camden, N. Y., who will build a large addition to their Hardware establishment. An elevator will be installed and the firm would be pleased to hear from manufacturers in this line.

FROM CARDONA Y CA., Cienfuegos, Cuba, who have recently reorganized their Hardware department, and would be glad to receive catalogues and other printed matter relating to Hardware products shipped to Cuba.

## DEATH OF ROBERT DONAHUE.

ROBERT DONAHUE, one of the pioneer Hardware merchants of the West, who established more than 50 years since the business which is now known as the Robert Donahue Iron & Hardware Company, Burlington, Iowa, died at his home in that city on the 4th inst.



ROBERT DONAHUE.

Mr. Donahue was born near Pittsburgh, Pa., February 18, 1831, of Scotch-Irish parentage. In 1850 he went to New York and entered upon his trade as marble cutter. In 1852 he was married to Miss Mary M. Glassford of New York, who, with an infant boy, died of cholera in 1853. In May of 1854 Mr. Donahue went to Burlington and subsequently went into business with Thompson McCosh under the firm name of Donahue & McCosh. This partnership dealt in Heavy Hardware and continued until 1883, when Mr. McCosh retired and Mr. Donahue continued alone until 1893, when the Robert Donahue Iron & Hardware Company was incorporated, with Mr. Donahue as president and treasurer, F. T. Donahue vice-president and R. W. Donahue secretary. Mr. Donahue served as president of the local Board of Education for two years, and was also a member of the City Council for a number of years. He was a consistent member of the Congregational Church and was one of Burlington's most progressive, public spirited and valued citizens. Mr. Donahue was married again in 1859 to Miss Mary A. McCosh, who survives him, together with five of their eight children. The business will be continued as before, under the management of Mr. Donahue's sons.



## PRICE-LISTS, CIRCULARS, &amp;c.

*Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, etc., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.*

THE CHAPIN-STEPHENS COMPANY, Pine Meadow, Conn.: Illustrated price-list of Flexible Folding Rules, with riveted joints, which have recently been added to the company's line.

W. E. CALDWELL COMPANY, Louisville, Ky.: Catalogue of Tanks, Towers and Tubs of all kinds, a specialty being made of large Water Tanks.

ALDINE GRATE & MANTEL COMPANY, Grand Rapids, Mich.: Catalogue of the Aldine open Fire Places, direct Draft Grates, Gas Grates, High Grade Wood Mantels, &c.

AMERICAN FORK & HOE COMPANY, Cleveland, Ohio.: Booklet entitled "Special Tools for Farm and Garden," in which the company illustrates a few of the special goods which it makes in addition to the regular line of Steel Goods.

LIVINGSTON NAIL COMPANY, 104 Reade street, New York: Printed matter relating to Can't Slip Horseshoe Calks and Nature's Own Horseshoes.

THE YALE & TOWNE MFG. COMPANY, 9-15 Murray street, New York: Attractive illustrated booklet of 20 pages, concerning "Locks and Hardware for Railroad Use," describing Yale Locks, Door Checks, Padlocks, Cabinet Locks, Master Keyed Locks, Builders' Hardware and Chain Blocks.

F. D. KEES, Beatrice, Neb.: Illustrated catalogue of Gossett's Detachable Suspension Hinge for hanging Screens and Storm Windows, including Fasteners for the same.

THE MARYLAND BELTING & PACKING COMPANY, Baltimore, Md.: Booklet relating to various grades of Garden Hose.

THE JOYCE, CRIDLAND COMPANY, Dayton, Ohio: Twenty-eighth annual illustrated catalogue of Geared Lever, Screw and Hydraulic Jacks.

THE OHIO STRUCTURAL IRON COMPANY, Sandusky, Ohio: Catalogue illustrating Lawn Furniture, Balcony Railings, Window Guards, Gates, Fire Escapes, Steel Shutters, Stable Fixtures, Jail Cells, Folding Mats, Tree Guards, &c.

THE CRESTLINE MFG. COMPANY, Crestline, Ohio: Folder calling attention to its line of Hand and Wind Mill Pumps.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass.: Abridged catalogue relating to Rifles, Shotgun Cleaners, Pistols, Shotguns, &c.

BARKER-JENNINGS HARDWARE COMPANY, Lynchburg, Va.: Pamphlet designed to give an idea of the many lines and varieties of goods which the company regularly carries in stock. The classified list thus provided is arranged alphabetically.

AMERICAN STEEL & WIRE COMPANY, Chicago: Pamphlet entitled "How to Use Sulphate of Iron on the Farm," and giving results from its use with various crops.

THE State Legislature of Illinois at its last session passed a bill requiring every ball of binder twine sold in the State to bear a tag stating name of the manufacturer, the grade of the twine and the number of feet to the pound, and providing heavy penalties for misrepresentations of length or quality.

Refor-Barr Company has succeeded the Poundstone-Refor Hardware Company, wholesale and retail Hardware, Farm Implements and Machinery, Stoves, Sporting Goods, &c., Ottawa, Ill. The new company consists of David Refor, for nine years a member of the former firm, and Jacob Barr, Jr.

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## RUSSELL & ERWIN MFG. COMPANY'S CHICAGO SHOWROOM.

**W**E illustrate herewith the new showroom of the Russell & Erwin Mfg. Company, at 22 Lake street, Chicago. The Chicago branch occupies all of the second floor of the building, the showroom and office

design to the number of samples shown behind them. For instance, a panel which will display three large escutcheons has three divisions, while one displaying six smaller articles will have six divisions. The color scheme of the room greatly enhances the general effect, as the dark brown of the weathered oak shades into the orange of the wall and into the delicate orange and violet of frieze above. There are 20 square tapering pi-



Fig. 1.—Russell & Erwin Mfg. Company's Chicago Showroom.

being in the front and the store in the rear. The showroom itself is 18 x 22 feet in dimensions. An attractive manner of displaying goods is employed, as samples are arranged in vertical showcases behind leaded doors with concealed electric lights, so placed as to illuminate the whole stock. Turning the switch the blaze

lasters carrying and surmounting the showcases, and each pillar has an electric light at its top in addition to the series of lights concealed behind the frame work inside the cases. There are two free standing columns flanking the entrance from the showroom to the office room. The office room is 16 x 24 feet in size, and the weathered oak furniture is carried out through it also, one side of the room being devoted to sample cupboards in which samples are inclosed. The decorative work was done by Berkeley Brandt, architect, and the same architect is now drawing plans for an elaborate entrance and stairway leading to the rooms above. The entrance will also be designed to serve the offices of D. B. Woodbury, representing the Stanley Works, on the main floor. Thomas J. Usher is Chicago manager of the Russell & Erwin Mfg. Company.



Fig. 2.—Another View of the Showroom.

of light shining on the highly polished samples produces an effect that is striking and beautiful. The cases are of quartered white oak, finished as weathered oak in a dark dull brown. The doors, which slide up on roller bearings, are fitted with ornamental leaded glass in delicate tints, the prevailing ornamentation being cherry blossoms. The six panels of each case correspond in their

### STEEL HOOPS FOR NAIL KEGS.

**T**HE Steel Hoops used on Nail Kegs by the American Steel & Wire Company, referred to in our issue of May 4, are manufactured by the Carnegie Company. Mr. Brainard, who is connected with this company, conceived the idea of Steel Hoops for use in connection with Nail Kegs and designed the necessary machines for manufacturing the Hoops. The company is now erecting a large mill which will be devoted almost exclusively to the manufacture of Steel Hoops for Nail Kegs.

The difficulty found in successfully stacking kegs with Steel Hoops by some jobbers was mentioned in the article alluded to. In this connection it will be of interest to learn that the plan adopted by a handler of large lots of Nails is to stack those having Steel Hoops by standing them on end, the upper keg overlapping two kegs beneath, half of the head on each keg.

Tilton Hardware Company, Tilton, N. H., has recently opened up in a new store, where a wholesale and retail business will be carried on in Shelf and Heavy Hardware, Stoves, Tinware, Implements, Paints, &c.



## TRADE ITEMS.

BAEDER, ADAMSON & Co., Philadelphia, Pa., are sending out to the trade an attractive card to be hung conspicuously in the store. The card tells the public that the merchant "Sells Baeder-Adamson Old Reliable Sandpaper." This company has been in existence for 77 years, and began the manufacture of Sandpaper by machinery half a century ago.

BULLARD AUTOMATIC WRENCH COMPANY, Providence, R. I., manufacturer of the Bullard Automatic Wrench, which is a Monkey, Ratchet and Pipe Wrench combined, announces that its own factory for the manufacture of these Wrenches is now in operation at 257 West Exchange street, Providence.

EDWIN A. BUCK died at his home in Willimantic, Conn., May 12, aged 72 years. He was for many years an extensive dealer in lumber, and with his son, George E. Buck, was engaged in the Hardware business at Stafford Springs, Conn., and Palmer, Mass. He served several terms in the Connecticut Legislature, the first when he was 24 years old, had been a member of the State Senate, was State Treasurer of Connecticut in 1877 and 1878 and a bank examiner from 1893 to 1895.

RESPONDING to a recent inquiry concerning the production of new goods or novel articles in Kitchen Utensils and House Furnishing Goods, the vice-president of the Lalance & Grosjean Mfg. Company remarked that with its immense variety of such commodities, one case of each style and size of Coffee Pots and Tea Pots alone made by the company will fill four freight cars, standard size, 36 feet long. This statement affords some conception of the scope and variety attained by the large manufacturing plants of the present time.

THE New York office of the Shultz Belting Company, St. Louis, Mo., A. B. Laurence, manager, has been moved from 113 Liberty street to 111 Chambers street, owing to the demolition of the former building. At the latter address a full stock of Sable Rawhide Belting and Oak Tanned Belting is carried, also Raw Hide Rope, Lace Leather and Round Belting of all descriptions. The company is likewise offering Harness Leather in the sides for manufacturers of Harness. Illustrated catalogue No. 24, in booklet form, has just been issued, which, in addition to a description of the Schultz Sable Rawhide Belting, includes a number of kindred Shultz specialties.

WALTER HART has removed from 113 Liberty street to 111 Chambers street, New York, where is carried a stock of the Hart specialties. Among them are the Hart Galvanized Flag Pole Bracket and Hart Fender. The latter is made from galvanized wire and so shaped as to prevent a flag flown from window sill, &c., from twining around the pole.

DRIVER-HARRIS WIRE COMPANY, Harrison (Newark), N. J., makes a specialty of Resistance Wires for electrical purposes, among which, described in a recent catalogue, are the Climax, S. B., Advance, German Silver and Ferronickel brands, each of which has an individuality adapting it for various kinds of electrical work. The company also manufactures Brass, Copper and Steel Wire, Magnet Wire, Electric Cords, Armature Binding Wire, &c.

IN a circular just issued by the Wisconsin Retail Hardware Association it is announced that the membership includes 475 merchants, which represents a very substantial growth since the annual meeting in February last. The circular points out the advantages enjoyed by the members of the association, especially in the way of low insurance cost in connection with the company established by the association. The prospects for a handsome dividend during the present year are referred to as especially bright. C. A. Peck of Berlin is secretary of both the company and the association.

THE firm of Geo. W. Brown, Jr., wholesale and retail Hardware, Machinery, Heating and Plumbing, &c., Hillsboro, Ill., is intending to build a large addition to its establishment. The addition will be 40 x 120 feet, two stories and basement. The firm will be in the market for

modern fixtures of all kinds to thoroughly equip this building, including Hardware Shelving, Floor Cases, Electric Elevator, Cash Carrier System, Office Furniture, Filing Cases, &c., and will be glad to hear from manufacturers making a specialty of these. When the addition is completed the firm will occupy an entire block with a frontage of 105 feet and a depth of 120 feet.

THE READING HARDWARE COMPANY, Reading, Pa., is putting into its Chicago branch an emergency stock. Up to two years ago this company carried a large stock in Chicago, but at that time decided to withdraw its stocks at its various branch offices. H. H. Bronson is Chicago manager.

HENRY R. TOWNE, president of the Yale & Towne Mfg. Company, sailed Tuesday, May 16, on the steamer Kaiser Wilhelm II for Bremen, to be gone from two to three months. Mr. Towne goes abroad principally on business, but with his many interests, cultivated tastes and wide acquaintance will doubtless also find pleasure and recreation in the trip.

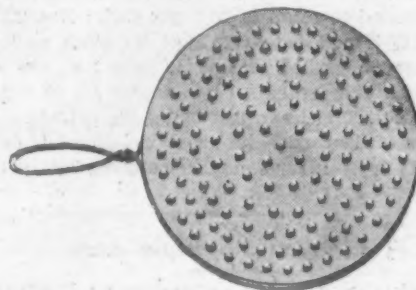
THE PRESBREY-MASON COMPANY, Taunton, Mass., has been organized for the purpose of continuing the business of the late William L. Presbrey, to transact a general Hardware and manufacturers' supply business and to make a specialty of electrical construction and installation in all its branches. Announcement of the new company is made by Fannie S. Presbrey and Ernest A. Mason.

### Edwin B. Stimpson & Son's Rules.

Edwin B. Stimpson & Son, 31 Spruce street, New York, are putting on the market a full and diverse line of wood rules of both boxwood and maple, which they refer to as strictly high grade. In regular goods are desk rulers, glaziers' rulers, board measures, wantage rods, tailors' curves, yardsticks, size sticks, Bufton gauges, gauging rods, saddlers' rules, shrinkage rules, jointed tailors' squares, glass board rules, tailors' meter sticks, paper hangers' straight edge, tailors' squares, freight rules, shoemakers' size sticks, extension rules and a number of wood novelties. In addition to the various styles and kinds of rules mentioned above, which are variously graduated in English and metric measurements, a variety of desk rulers are made in quantities for concerns who want their imprint on them, often for advertising purposes and gratuitous distribution. The graduations are cut by machinery clear to edge of brass strip and blacked.

### Rulofson's California Toaster.

A. C. Rulofson Company, New Montgomery and Mission streets, San Francisco, Cal., is offering the toaster shown herewith. It is said that it will toast bread uniformly without scorching or burning; that it will heat

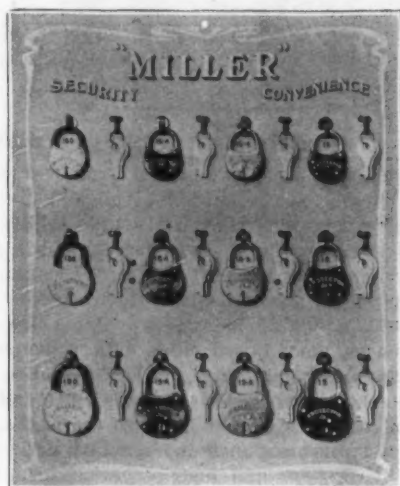


Rulofson's California Toaster.

rolls and biscuits; that it destroys all fumes arising from oil, gas or coal; that it will retain sufficient heat to keep food warm for a long time after taking off the fire, and that when placed under sauce pans containing breakfast foods, &c., it will keep them from scorching, taking the place of a double boiler. The adaptability of the toaster for use as a warming pan, foot warmer or carriage heater is also referred to.

### Patented Padlock Card Assortments.

Miller Lock Company, Frankford, Philadelphia, Pa., is putting on the market lithographed padlock card assortments, each assortment consisting of one dozen different padlocks, mounted on heavy cardboard, with keys which are so arranged that they can be unhooked and used to remove or replace the locks. Each lock covers its own picture on the card. The picture thus identifies the lock and ornaments the card after the lock has been removed and until it has been returned or another of the same style put in its place. Each card has an eyelet by which it may be hung up, and also an easel permitting it to stand upon table or counter. The cards have been patented, the patented feature lying in the combination of the *fac-simile* picture with the goods themselves arranged upon the card. It is obvious that the idea can be applied to many other lines of goods. Among the advantages secured by the use of these cards the company mentions the following: That it provides an attractive display of the goods; that as fast as the locks are sold the card may be replenished with others of the same kind, keeping the card full all the time; that the cards may be used to display the goods more conveniently



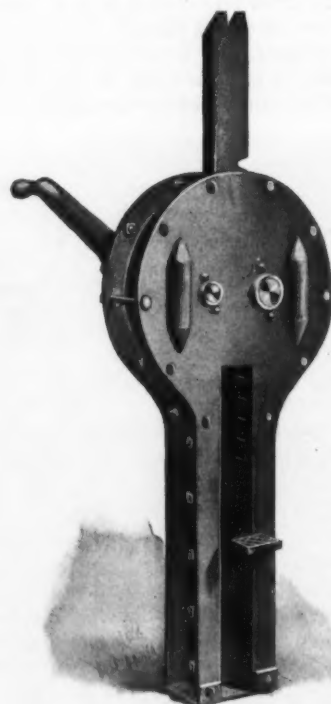
Patented Padlock Card Assortments.

than in any other way; that the customers can examine the goods when displayed in this manner with more satisfaction than when packed in the usual boxes, and that the illustrations serve to advertise the goods, and being exact *fac-similes* of the goods, have a tendency to prevent substitutions. The actual size of these lithographic cards is 13 by 16 inches. Half a dozen of the patented card assortments are offered, A, B, C, D, E and F, at varying prices. Assortment A, for example, consists of one each of the following padlocks: Nos. 180, 18A, 18B and 18, intended to retail at 15 cents each; Nos. 210, 21A, 21B and 21, intended to retail at 25 cents each; Nos. 220, 22A, 22B and 22, intended to retail at 35 cents each. The assortments are packed two cards in a box, the weight of which, box and contents (assortment A), is 8 pounds, the net weight of locks in box being 5¾ pounds. A case lot consists of 48 cards, the gross weight of which (assortment A) is 240 pounds, and measuring 30½ x 18 x 21 inches.

### The Green Mountain Jack.

The jack shown in the accompanying illustration is designed to withstand heavy work and has as a special feature a ratchet handle, which is useful for many purposes, especially in handling machinery, and heavy tools. This handle is furnished when desired, otherwise the tool is made with the common handle. The lifting power is derived through a chain of cast steel gears, there being three intermediate gears between the pinion to which the handle is attached and the pinion which engages the lifting post. The stock and the face plate to which the journal boxes are attached are of pressed steel. The front face plate is riveted to the stock, and the rear

face plate is bolted to the stock and may be removed to gain access to the inside gearing. The journals are large and their bushings are of hard bronze. The jacks range

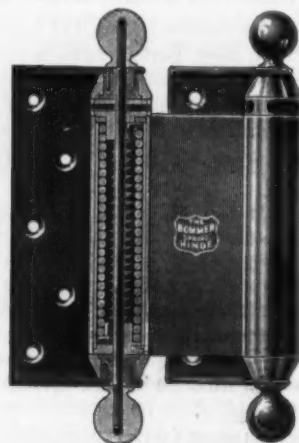


The Green Mountain Jack.

in capacity from 4 to 15 tons lifting power. They are manufactured by the Dalrymple Iron Works, Fair Haven, Vt.

### The Bommer Improved Spring Butt Hinges.

Bommer Brothers, 255-271 Classon avenue, Brooklyn, N. Y., have improved their line of spring butt hinges, as shown in the accompanying cut. Formerly the ball tips were riveted to the pintles, making it necessary, in order to take the hinge apart, to file off the rivet head at the bottom or top ball tip, which was somewhat inconvenient. Through a recently patented improvement the riveting is



The Bommer Improved Spring Butt Hinges.

entirely done away with, a pintle with threaded ends being used. The thread of the ball tip forming the nut is of a different pitch from that of the pintle ends, so that a sufficiently rigid hold is obtained to prevent the pintle and ball tip unscrewing, unless considerable force is used, without, however, injuring the threads, even after the hinge is taken apart several times. The improvement is referred to as a convenience to hardware merchants distant from the factory, as it enables them, when in immediate need of the Bommer spring hinges of a finish they do not have in stock, to have hinges of any finish they do carry taken apart and refinished by any local plater.



## Headson Pipe Cutters.

Fig. 1 of the accompanying cuts represents a rotary cutter made in three sizes to take in a range of pipe from  $\frac{1}{8}$  inch to 6 inches, inclusive. To change the tool from one size of pipe to another the handle is screwed up or down, when it adjusts itself to all sizes within its range. All parts of the cutter are interchangeable. Cut-

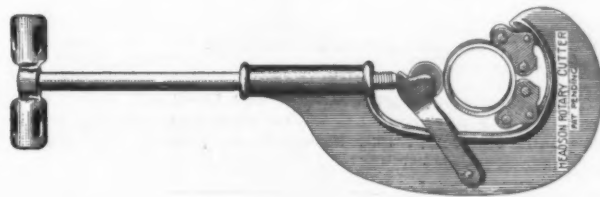


Fig. 1.—Headson Rotary Cutter.

ter No. 1 is for pipe from  $\frac{1}{8}$  inch to 2 inches; No. 2, from  $1\frac{1}{2}$  to 4 inches, and No. 3, from 2 to 6 inches, inclusive. A knife cutter is illustrated in Fig. 2, which the manufacturer states leaves the pipe free from burrs both inside and outside. The cut illustrates the manner in which pipe is held between the antifriction roller and the inserted jaw. The tool is adjusted to the pipe by pushing the handle forward until the antifriction rolls come in contact with the pipe. Lost motion is then taken up by turning the fluted handle, which causes the frame

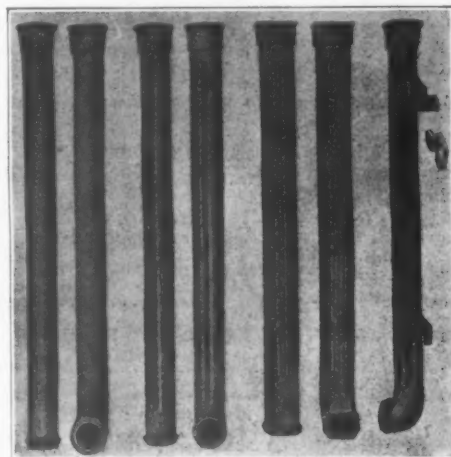


Fig. 2.—Headson Knife Cutter.

portion to slide on the main frame. Split nuts on each side allow the handle to move forward when it is pushed. The design of the cutter is to make a quick adjustment, so that the handle will not have to be turned all the way up in order to cut various sizes of pipe. After the handle has been pushed up it requires but a turn of the fluted handle to tighten it on the pipe. The cutter is made in three sizes to take in a range of pipe from  $\frac{1}{8}$  inch to 4 inches. The pipe cutters are put on the market by Headson Tool & Mfg. Company, Lafayette, Ind.

## Universal Cast Iron Conductor Boots.

With a view to providing a durable base for a conductor pipe the Canton Foundry & Machine Company, Canton, Ohio, has put on the market the Universal cast iron sewer connections and boots shown in the accompanying illustration. It will be noted that they are made in several styles, each style adapted either for a direct connection with a sewer or for discharging the contents of the conductor pipe in a surface gutter. They are made of such sizes as to connect with standard galvanized iron conductors. They are designed to be supported by means of special wall brackets securely fastened to a brick wall by means of extension bolts or by means of screws to a frame building. These wall



Universal Cast Iron Conductor Boots.

brackets are constructed so that the conductor pipe is supported at varying distances from the building, the standard bracket being  $1\frac{1}{2}$  inches. The outlets thus can be readily removed for cleansing, or in case of breakage a new part can be inserted without interfering with the wall connections. They are made for 3, 4, 5 and 6 inch pipe.

E. C. Perriman has sold his Hardware, Implement, Paint, Stove and Harness business at Centralia, I. T., to Centralia Supply Company.

## PAINTS, OILS AND COLORS

## White Lead, Zinc, &amp;c.—

Lead, English white, in Oil..	94@94
Lead, American white, in Oil:	
Lots of 500 lb or over.....	64
Lots less than 500 lb.....	7
In Barrels.....	6
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	1/2
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	1
Lead, White, in oil, 1 to 5 lb	
assorted tins, add to keg price..	1 1/2
Lead, American, Terms: For lots 12	
tons and over 1/4¢ rebate; and 2% for	
cash if paid in 15 days from date of	
invoice; for lots of 500 lbs. and over	
2% for cash if paid in 15 days from	
date of invoice, for lots of less than	
500 lbs. net.....	1/2
Lead, White, Dry in bbls.....	6
Zinc, American, dry.....	4@4 1/2
Zinc, French:	
Paris, Red Seal, dry.....	8 1/2
Paris, Green Seal, dry.....	9 1/2
Antwerp, Red Seal, dry.....	7 1/2
Antwerp, Green Seal, dry.....	8 1/2
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	11 1/2@12 1/2
Lots of less than 1 ton.....	11 1/2@12 1/2
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over.....	10 1/2@10 7/8
Lots of less than 1 ton.....	10 1/2@11 1/8
Discounts.—French Zinc.—Discounts	
to buyers of 10 bbl, lots of one or mixed	
grades, 1%; 25 bbls, 2%; 50 bbls, 4%.	

## Dry Colors—

Black, Carbon.....	5 @ 10
Black, Drop, Amer.....	4 @ 6
Black, Drop, Eng.....	4 @ 15
Black, Ivory.....	16 @ 20
Lamp, Com.....	4 1/2 @ 6
Blue, Celestial.....	4 @ 6
Blue, Chinese.....	23 @ 32
Blue, Prussian.....	27 @ 30
Blue, Ultramarine.....	4 1/2 @ 15
Brown, Spanish.....	1 1/2 @ 1
Carmin, No. 40.....	3.50 @ 3.60
Green, Chrome, ordinary.....	3 1/2 @ 6

Green, Chrome, pure.....	17 @ 25
Lead, Red, bbls, 1/2 bbls, and kegs:	
Lots 500 lb or over.....	6 1/2
Lots less than 500 lb.....	7
Litharge, American, bbls.....	6 @ 6 1/2
Ocher, American.....	1 ton \$8.50@16.00
Orcher, American Golden.....	2 1/2 @ 3 1/2
Orcher, French.....	1 1/2 @ 2 1/2
Orcher, Foreign Golden.....	3 @ 4
Orange Mineral, English.....	3 @ 4
Orange Mineral, French.....	10 1/2 @ 11 1/4
Orange Mineral, German.....	7 1/2 @ 10
Orange Mineral, American.....	8 @ 8 1/2
Red, Indian, English.....	4 1/2 @ 5 1/2
Red, Indian, American.....	3 @ 3 1/2
Red, Turkey, English.....	4 @ 10
Red, Tuscan, English.....	7 @ 10
Red, Venetian, Amer.....	100 lb \$0.50@1.25
Red Venetian, English.....	100 lb \$1.15@1.75
Sienna, Italian, Burnt and	
Powdered.....	3 @ 9 1/2
Sienna, Ital., Raw, Powd.....	3 @ 6 1/2
Sienna, American, Raw.....	1 1/2 @ 2
Sienna, American, Burnt and	
Powdered.....	1 1/2 @ 2
Talc, French.....	1 ton \$20.00@30.00
Talc, American.....	1 ton 16.00@25.00
Terra Alba, French.....	100 lb 90 @ 1.00
Terra Alba, English.....	100 lb 90 @ 1.00
Terra Alba, American.....	100 lb 90 @ 1.00
No. 1.....	60 @ 70
Terra Alba, American.....	100 lb 90 @ 1.00
No. 2.....	45 @ 50
Umber, Turkey, Raw & Pow.....	2 1/2 @ 3 1/2
Umber, Turkey, Raw & Pow.....	2 1/2 @ 3 1/2
Umber, Burnt, Amer.....	1 1/2 @ 2
Umber, Raw, Amer.....	1 1/2 @ 2
Yellow, Chrome.....	11 @ 14
Vermilion, American Lead.....	10 @ 25
Vermilion, Quicksilver, bulk.....	6 @ 25
Vermilion, Quicksilver, bags.....	6 @ 25
Vermilion, English, Import.....	75 @ 80
Vermilion, Chinese.....	\$0.30@1.00

## Colors in Oil—

Black, Lampblack.....	12 @ 14
Black, Chinese.....	36 @ 46
Blue, Prussian.....	22 @ 26
Blue, Ultramarine.....	13 @ 16
Brown, Van Dyke.....	11 @ 14
Green, Chrome.....	10 @ 15
Green, Paris.....	24 @ 25

Sienna, Raw.....	12 @ 15
Sienna, Burnt.....	12 @ 15
Umber, Raw.....	11 @ 14
Umber, Burnt.....	11 @ 14

## Miscellaneous—

Barytes, White, Foreign.....	1 ton \$17.50@19.00
Barytes, Amer. floated.....	1 ton 17.00@19.00
Chalk, in bulk.....	1 ton 3.00@3.25
Chalk, in bbls.....	100 lb .35
China Clay, English.....	1 ton 11.00@17.00
Cobalt, Oxide.....	100 lb 2.50@2.60
Whiting, Common.....	100 lb .43@.48
Whiting, Gilders.....	100 lb .50@.55
Whiting, Ex. Gilders.....	100 lb .55@.60

## Putty, Commercial—

In bladders.....	\$1.70
In bbls. or tubes.....	1.05@1.10
In 1 lb to 5 lb cans.....	2.00@2.90
In 12 1/2 to 50 lb cans.....	1.40@1.55

## Spirits Turpentine—

In Oil bbls.....	6 1/2 @ 6 5/8
In machine bbls.....	6 1/2 @ 6 5/8

## Glue—

Cabinet.....	11 @ 15
Common Bone.....	7 @ 9
Extra White.....	18 @ 24
Foot Stock, White.....	11 @ 14
Foot Stock, Brown.....	3 @ 11
German Hide.....	12 @ 18
French.....	10 @ 40
Irish.....	13 @ 16
Low Grade.....	9 @ 12
Medium White.....	14 @ 17

## Gum Shellac—

Bleached Commercial.....	30 @ 31
Bone Dried.....	40 @ 41
Button.....	36 @ 45
Diamond.....	40 @ 45
Pine Orange.....	30 @ 32
A. C. Garnet.....	33 @ 35
D. C.....	65 @ 66
Octagon B.....	45 @ 50
T. N.....	30 @ 31
V. S. O.....	50 @ 52

## Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	48 @ 49
Linseed, City, boiled.....	50 @ 51
Linseed, State and West'n, raw.....	46 @ 47
Linseed, raw Calcutta seed.....	60 @ 61
Lard, Prime, Winter.....	38 @ 39
Lard, Extra No. 1.....	47 @ 48
Lard, No. 1.....	35 @ 36
Cotton-seed, Crude, f.o.b. mills.....	21 @ 21 1/2
Cotton-seed, Summer Yellow.....	27 1/2 @ 27 3/4
Cotton-seed, Summer Yellow, off grades.....	27 1/2 @ 27 3/4
Sperm, Crude.....	60 @ 61
Sperm, Natural Spring.....	60 @ 61
Sperm, Bleached Spring.....	60 @ 61
Sperm, Natural Winter.....	60 @ 61
Sperm, Bleached Winter.....	60 @ 61
Tallow, Prime.....	51 @ 53
Whale, Crude.....	42 @ 44
Whale, Natural Winter.....	42 @ 44
Whale, Bleached Winter.....	42 @ 44
Menhaden, Brown, Strained.....	23 @ 29
Menhaden, Light, Strained.....	23 @ 29
Menhaden, Bleached, Winter.....	31 @ 32
Menhaden, Ex-Bld. Winter.....	32 @ 33
Menhaden, Southern.....	17 @ 18
Cocanut, Ceylon.....	1 lb 6 1/4 @ 6 1/2
Cocanut, Coch.....	1 lb 6 1/4 @ 6 1/2
Cod, Domestic, Prime.....	35 @ 37
Cod, Newfoundland.....	40 @ 42
Red Elaine.....	31 @ 32
Red, Saponified.....	1 lb 4 1/2 @ 5
Olive, Italian, bbls.....	54 @ 57
Neatsfoot, prime.....	49 @ 50
Palm, Logos.....	1 lb 5 1/4 @ 5 1/2

## Mineral Oils—

Black, 29 gravity, 25@30 cold test.....	10 1/2 @ 11 1/4
Black, 29 gravity, 15 cold test.....	11 1/4 @ 12 1/4
Black, Summer.....	10 1/4 @ 11 1/4
Cylinder, light filtered.....	18 @ 19
Cylinder, dark filtered.....	18 @ 17
Paraffine, 903-907 gravity.....	12 1/2 @ 13
Paraffine, 903 gravity.....	11 1/4 @ 12
Paraffine, 883 gravity.....	9 1/4 @ 9 1/2
Paraffine, Red.....	11 1/2 @ 13
In small lots 1/2¢ advance.	

# Current Hardware Prices.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$  @ 33 $\frac{1}{2}$  & 10% signifies

that the price of the goods in question ranges from 33 $\frac{1}{2}$  per cent. discount to 33 $\frac{1}{2}$  and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00.....33 $\frac{1}{2}$ %  
North's.....10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent.....35%  
Taplin's Perfection.....35%

**Ammunition—** See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvils..... $\frac{1}{2}$  lb 7 $\frac{1}{2}$ @7 $\frac{1}{2}$ %  
Hay-Budden, Wrought.....90%  
Horseshoe brand, Wrought.....90%  
Trenton..... $\frac{1}{2}$  lb 9 $\frac{1}{2}$ %

## Imported—

Peter Wright & Sons..... $\frac{1}{2}$  lb 10 $\frac{1}{2}$ %

## Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15&10%

## Apple Parers—

Apple, &c.

## Aprons, Blacksmiths'—

Livingston Nail Co.....33 $\frac{1}{2}$ %

## Augers and Bits—

Com. Double Spur.....70&10%  
Boring Mach. Augers.....70&10%  
Car Bits, 12-in. twist.....50&10%  
Jennings' Patn. reg. finish.....50&10%  
Ford's Auger and Car Bits.....40&5%  
Forster Pat. Auger Bits.....25%  
C. E. Jennings & Co.:  
No. 10 ext. lip. R. Jennings' list.....25%  
No. 30, R. Jennings' list.....40&10%  
Russell Jennings' list.....25&10&2 $\frac{1}{2}$ %  
L'Hommedieu Car Bits.....15%  
Mayhew's Counterank Bits.....45%  
Millers Falls.....50&10&7 $\frac{1}{2}$ %  
Ohio Tool Co.'s Bailey Auger and Car Bits.....20%  
Pugh's Black.....20%  
Pugh's Jennings' Pattern.....35%  
Snell's Auger Bits.....60%  
Snell's Bell Hangers Bits.....60%  
Snell's Car Bits, 12-in. twist.....60&10%  
Wright's Jennings' Bits.....50%

## Bit Stock Drills—

See Drills, Twist.

## Expansive Bits—

Clark's small, \$18; large, \$26.....50&10%  
Clark's Pattern, No. 1,  $\frac{1}{2}$  doz. \$26;  
No. 2, \$18.....50&10&60%  
Ford's, Clark's Pattern.....50&10&60%  
C. E. Jennings & Co., Steer's Pat.....25%  
Swan's.....40%

## Gimlet Bits—

Common Dble. Out. .... $\frac{1}{2}$  doz. \$3.00@3.25  
German Pattern, Nos. 1 to 10,  
\$1.60; 11 to 13, \$5.75

## Hollow Augers—

Bonney Pat., per doz. \$9.00@10.00  
Ames.....25&10%  
New Patent.....25&10%  
Universal.....20%  
Wood's Universal.....25%

## Ship Augers and Bits—

Ford's.....33 $\frac{1}{2}$ @5%  
C. E. Jennings & Co.:  
L'Hommedieu's.....15%  
Watrous'.....35&5%  
Ohio Tool Co.'s.....40%  
Snell's.....40%

## Awl Hafts—

See Hafts, Awl.

## Awls—

Erad Awls:  
Handled.....gro. \$2.75@3.00  
Unhanded, Shlided.....gro. \$3.75@4.00  
Unhanded, Patent.....gro. \$6.60@7.00  
Peg Awls:  
Unhanded, Patent.....gro. \$1.50@1.75  
Unhanded, Shlided.....gro. \$5.00@5.50  
Scratch Awls:  
Handled, Com.....gro. \$3.50@4.00  
Handled, Socket.....gro. \$11.50@12.00  
Hurdwood.....40%

## Awl and Tool Sets—

See Sets, Awl and Tool.

## Axes—

Single Bit, base weights. (up to 3 $\frac{1}{2}$  lb.)  
First Quality.....\$6.50  
Second Quality.....\$6.00  
NOTE.—Heavier Weights add Extras as per regular schedule.

## Axle Grease—

See Grease, Axle

## Axles—

Concord, Loose Collar.....4 $\frac{1}{2}$ @4 $\frac{1}{2}$ %  
Concord, Solid Collar.....4 $\frac{1}{2}$ @4 $\frac{1}{2}$ %  
No. 1 Common Loose.....3 $\frac{1}{2}$ @3 $\frac{1}{2}$ %  
No. 1 $\frac{1}{2}$  Com., New Styles.....4 $\frac{1}{2}$ @4 $\frac{1}{2}$ %  
No. 2 Solid Collar.....4 $\frac{1}{2}$ @4 $\frac{1}{2}$ %  
Nos. 7, 8, 11 and 12.....70&10%  
Nos. 13 to 18.....70&10%  
Nos. 19 to 22.....75&10%  
Nos. 23 to 25.....75&10%

## Boxes, Axle—

Common and Concord, not turned  
lb. 1 $\frac{1}{2}$ @1 $\frac{1}{2}$ %  
Common and Concord, turned,  
lb. 5 $\frac{1}{2}$ @5 $\frac{1}{2}$ %  
Half Patent.....lb. 8 $\frac{1}{2}$ @8 $\frac{1}{2}$ %

## Bait— Fishing—

Hendryx:  
A Bait.....20%  
B Bait.....25%  
Competitor Bait.....25&5%

## Balances— Sash—

Caldwell new list.....50%  
Pullman.....50&10@60%

## Spring—

Spring Balances.....60@60&5%  
Chatillon's:  
Light Spg. Balances.....40&10%  
Straight Balances.....40%  
Circular Balances.....50%  
Large Dial.....30%  
Barb Wire—See Wire, Barb.

## Bars— Crow—

Steel Crowbars, 10 to 40 lb.  
per lb., 2 $\frac{1}{2}$ @3 $\frac{1}{2}$ %

## Towel—

No. 10 Ideal, Nickel Plate..... $\frac{1}{2}$  gro. \$8.50

## Beams, Scale—

Scale Beams.....40&10@50%  
Chatillon's No. 1.....30%  
Chatillon's No. 2.....40%

## Beaters, Carpet—

Holt-Lyon Co.:  
No. 12 Wire Coppered  $\frac{1}{2}$  doz. \$0.85;  
Tinned.....\$1.00  
No. 11 Wire Coppered  $\frac{1}{2}$  doz. \$1.10;  
Tinned.....\$1.20  
No. 10 Wire Galvanized..... $\frac{1}{2}$  doz. \$1.75  
Western W. G. Co.:  
No. 1 Electric..... $\frac{1}{2}$  gro. \$7.80  
No. 2 Buffalo..... $\frac{1}{2}$  gro. \$9.00  
No. 3 Perfection Dust..... $\frac{1}{2}$  gro. \$8.00

## Egg—

Holt-Lyon Co.:  
Holt, No. A, Japanned..... $\frac{1}{2}$  doz. \$1.20  
Holt, No. A, Tinned..... $\frac{1}{2}$  doz. \$1.50  
Holt, No. B, Japanned..... $\frac{1}{2}$  doz. \$2.00  
Holt, No. 2, Tinned..... $\frac{1}{2}$  doz. \$2.25  
Lyon, No. 2, Japanned..... $\frac{1}{2}$  doz. \$1.25  
Lyon, No. 2, Tinned..... $\frac{1}{2}$  doz. \$1.50  
Taplin Mfg. Co.:  
No. 60 Improved Dover.....\$6.00  
No. 75 Improved Dover.....\$6.50  
No. 100 Improved Dover.....\$7.00  
No. 102 Improved Dover, Tin'd.....\$8.50  
No. 150 Improved Dover, Hotel.....\$15.00  
No. 152 Imp'd Dover, Hotel, T'd.....\$17.00  
No. 200 Imp'd Dover Tumbler.....\$25.00  
No. 202 Imp'd Dover Tumbler, T'd.....\$29.50  
No. 300 Imp'd Dover Mammoth..... $\frac{1}{2}$  doz.  
Western W. G. Co. Buffalo.....\$7.00  
Wonder (S. B. & Co.),  $\frac{1}{2}$  gro. net, \$6.00

## Bellows—

Blacksmith, Standard List.....60&10@70&10%

## Blacksmiths'—

Inch. 30 32 34 36 38 40  
Each.....\$3.25 3.50 4.00 4.50 5.00 5.75  
Extra Length:  
Each.....\$3.75 4.25 4.75 5.25 6.00 7.00

## Hand—

Inch. 6 7 8 9 10  
Doz.....\$4.50 5.00 5.50 6.00 6.50

## Molders—

Inch. 9 10 11 12 14  
Doz.....\$3.00 9.00 10.50 12.50 14.50

## Bells— Cow—

Ordinary goods.....75&5@75&10&5%  
High grade.....70&10@70&10&5%  
Jersey.....75&10%  
Texas Star.....50%

## Door—

Abbe's Gong.....45%  
Burton Gong.....50%  
Home, R. & E. Mfg. Co.'s.....55&10%  
Lever and Pull, Sargent's.....80&10&10%  
Trip Gong.....50&10@50&10&5%  
Yankee Gong.....55%

## Hand—

Hand Bells, Polished, Brass.....60&5@60&10&5%  
White Metal.....60%  
Nickel Plated.....50&10@50&10&5%  
Swiss.....60&60&7 $\frac{1}{2}$ %  
Cone's Globe Hand Bells.....33 $\frac{1}{2}$ @35%  
Silver Chime.....33 $\frac{1}{2}$ @35%

## Miscellaneous—

Farm Bells.....lb. 2 $\frac{1}{4}$ %  
Steel Alloy Church and School.....50&10&5@60&5%  
American Tube & Stamping Co.  
Gongs.....75%  
Table Call Bells.....50&50&10%

## Belting— Leather—

Extra Hvy, Short Lap.....60@60&5%  
Regular Short Lap.....65&10@70%  
Standard.....70&5@70&10%  
Light Standard.....70&10@75%  
Cut Leather Lacing.....60&10%  
Leather Lacing Sides, per sq. ft.  
17 $\frac{1}{2}$ @18 $\frac{1}{2}$ %

## Rubber—

Agricultural (Low Grade).....75@75&5%  
Common Standard.....70@70&10%  
Standard.....65&70%  
Extra.....60&5@60&10%  
High Grade.....50&5@50&10%

## Bench Stops—

See Stops, Bench

## Benders and Upsetters,

Tire—

Detroit Perfected Tire Bender.....40%  
Green River Tire Benders and Upsetters.....20%  
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25;  
No. 3, \$10.50; No. 4, \$18.25; No. 5, \$20.50.

## Bicycle Goods—

John S. Lang's Son's 1902 list:  
Chain.....50%  
Parts.....50%  
Spokes.....50%  
Tubes.....60%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

## Blocks— Tackle—

Common Wooden.....70&10@75&5%  
Harts St. Tackle Blocks.....50&50&5%  
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%  
Lane's Patent Automatic Lock and Junior.....30%  
Stover's Novelty, Mal. Iron.....50&10%  
Stowell's Self Loading.....60%  
See also Machines, Hoisting.

## Boards, Stove—

Zinc, Crystal, &c.....30&19@40&10%

## Boards, Wash—

See Washboards.

## Bobs, Plumb—

Keuffel & Esser Co.....30@35

## Boils—

Carriage, Machine, &c.—

Common Carriage (cut thread):  
% & 6 and smaller.....75%  
Larger and longer.....65&10&2 $\frac{1}{2}$ %  
Phila. Eagle \$3.00 list May 21, '99

Bolt Ends, list Feb. 14, '95.....70&2 $\frac{1}{2}$ %  
Machine, % & 4 and smaller.....75&2 $\frac{1}{2}$ %  
Machine, larger and longer.....70&5%

## Door and Shutter—

Cast Iron Barrel, Japanned,  
Round Brass Knob:  
Inch.....3 4 5 6 8  
Per doz.....\$0.30 3.45 5.50 7.50  
Cast Iron Spring Foot, Jap'd:  
Inch.....6 8 10  
Per doz.....\$1.15 1.40 2.00  
Cast Iron Chain, Flat Japanned:  
Inch.....6 8 10  
Per doz.....\$0.95 1.25 1.55  
Cast Iron Shutter, Japanned,  
Brass Knobs:  
Inch.....6 8 10  
Per doz.....\$0.80 90 1.20  
Wrt Barrel Jap'd.....80@80&10%  
Wrt "Bronzed".....50@50&10%  
Wrt Spring.....70&10@70&10&5%  
Wrt Shutter.....50&5@50&10&5%  
Wrt Square Neck.....75@75&10%  
Wrt Square.....66%&10&66%&10&10%  
Ives' Patent Door.....60%

## Stove and Plow—

Plow.....65&10@65&10&10%  
Stove.....82 $\frac{1}{2}$ @10@82 $\frac{1}{2}$ @10&5%

## Tire—

Common.....80%  
Norway Iron.....80%  
American Screw Company:  
Norway Phila. list Oct. 16, '94.....80%  
Eagle Phila. list Oct. 16, '94.....82 $\frac{1}{2}$ %  
Bay State, list Dec. 28, '99.....80%  
Franklin Moore Co.:  
Norway Phila. list Oct. 16, '94.....80%  
Eagle Phila. list Oct. 16, '94.....82 $\frac{1}{2}$ %  
Eclipse, list Dec. 28, '99.....80%  
Russell, Burdall & Ward Bolt & Nut Co.:  
Empire, list Dec. 28, '99.....80%  
Norway Phila. list Oct., '94.....80%  
Upon Nut Co.:  
Tire Bolts.....72 $\frac{1}{2}$ %

## Borers, Tap—

Borers Tap, Ring, with Handle:  
Inch.....1 $\frac{1}{4}$  1 $\frac{1}{2}$  1 $\frac{3}{4}$  2  
Per doz.....\$1.80 5.60 6.40 8.00  
Inch.....2 $\frac{1}{4}$  2 $\frac{1}{2}$  2 $\frac{3}{4}$  3  
Per doz.....\$5.65 11.50  
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each.....25%

## Boxes, Mitre—

C. E. Jennings & Co.....30%  
Langdon.....15&10%  
Perfection..... $\frac{1}{2}$  doz. \$30.00  
Stanley R. & L. Co.:  
Nos. 240 to 460.....30%  
Nos. 50 and 60.....35%

## Braces—

Common Ball American \$1.25@1.30  
Barber's.....50&10&10&60&10%  
Fray's Genuine Spofford's.....60%  
Fray's No. 70 to 120, 81 to 123, 207 to 411.....60%  
C. E. Jennings & Co.....50&5%  
Mayhew's Ratchet.....60%  
Mayhew's Quick Action Hay Pat.....50%  
Millers Falls Drill Braces.....25&10%  
P. S. & W. Co. Peck's Pat. 60&10&65%  
Stanley R. & L. Co.:  
Stanley.....35%  
Victor.....45%

## Brackets—

Wrought Steel.....80&10@80&10&5%  
Bradley's Wire Shelf:  
Full cases.....80&10&10%  
Broken cases.....80&10%  
Griffin's Pressed Steel.....80&10%  
Griffin's Folding Brackets.....70&10%  
Stowell's Cast Shelf.....75%  
Stowell's Sink.....50%  
Western W. G. Co., Wire.....60&10%

## Bright Wire Goods—

See Wire and Wire Goods.

## Boilers—

Kilbourne Mfg. Co.....75&20%  
Western W. G. Co.....75&10%  
Wire Goods Co.....75@75&10%

## Buckets, Galvanized—

Price per dozen:  
Quart.....19 12 14  
Water, Regular.....1.40 1.70 1.90  
Water, Heavy.....3.40 3.70 3.80  
Fire, Rd. Bottom.....2.30 2.55 2.95  
Well.....2.55 2.87 3.15

## Bucks, Saw—

Hoosier..... $\frac{1}{2}$  gro. \$36.00

## Bull Rings—

See Rings, Bull

## Butts— Brass—

Wrought, list Sept., '96.....30%  
Cast Brass, Tiebout's.....50%

## Cast Iron—

Fast Joint, Broad.....40&10@50%  
Fast Joint, Narrow.....40&10@50%  
Loose Joint.....70&10@75%  
Loose Pin.....70&10@75%  
Mayer's Hinges.....70&10@75%  
Parliament Butts.....70&10@75%

## Wrought Steel—

Table and Back Flaps.....75%  
Narrow and Broad.....75%  
Inside Blind.....75%  
Loose Pin.....75%  
Loose Pin, Jap'd.....70&10%  
Loose Pin, Ball and Steeple Tip.....85%  
Japanned Ball Tip Butts.....70&10%  
Es., 10&10@10&10&5%  
Bronzed, Wrt., Nar. and Inside Blind Butts.....65&10%

## Cages, Bird—

Hendryx, Brass:  
500, 600, 1100 series.....\$2  
1200 series.....35%  
200, 300, 600 and 900 series.....60&10%

Net Prices.



Hendryx Bronze: 40&10%  
Hendryx Enameled: 40&10%

### Calipers—See Compasses.

### Calks, Toe and Heel—

Blunt, 1 prong... per lb. 1.45¢  
Sharp, 1 prong... per lb. 1.45¢  
Gautier, Blunt... 1.45¢  
Gautier, Sharp... 1.45¢  
Perkins, Blunt Toe... 1.45¢  
Perkins, Sharp Toe... 1.45¢

### Can Openers—

See Openers, Can.

### Cans, Milk—

5 8 10 gal.  
Illinois Pattern... 1.35 1.85 2.05 each.  
New York Pattern... 1.50 2.20 2.45 each.  
Baltimore Pattern... 1.50 2.20 2.45 each.  
Dubuque... 1.35 1.60 1.75 each.

### Cans, Oil—

Buffalo Family Oil Cans:  
3 5 10 gal.  
\$18.00 60.00 129.00 gro., net.

### Caps, Percussion—

Eley's E. B... 50¢  
G. D... per M 34¢  
F. L... per M 40¢  
G. E... per M 40¢  
Musket... per M 62¢

### Primers—

Berdan Primers, \$2 per M... 20%  
B. L. Caps (Sturtevant Shells) \$2 per M... 20%  
All other primers per M \$1.50@1.60

### Cartridges—

Blank Cartridges:  
32 C. F., \$5.50... 10¢  
35 C. F., \$7.00... 10¢  
22 cal. Rim, \$1.50... 10¢  
32 cal. Rim, \$2.75... 10¢  
B. B. Caps, Con. Ball, Supd. \$1.90  
B. B. Caps, Round Ball... 25¢  
Central Fire... 15¢  
Target and Sporting Rifle... 15¢  
Primed Shells and Bullets... 15¢  
Rim Fire, Sporting... 50¢  
Rim Fire, Military... 15¢

### Castors—

Bed... 70¢  
Plate... 60¢  
Philadelphia... 75¢  
Acme, Ball Bearing... 70¢  
Boss... 70¢  
Boss Anti-Friction... 70¢  
Gem (Roller Bearing)... 80¢  
Martin's Patent (Phoenix)... 45¢  
Standard Ball Bearing... 45¢  
Tucker's Patent... 50¢  
Yale (Double Wheel) low list... 50¢

### Cattle Leaders—

See Leaders, Cattle.

### Chain, Coil—

American Coil, Straight Link:  
3-16 1/4 5-16 3/4 7-16 3/4 9-16  
\$7.50 5.35 4.40 3.70 3.55 3.45 3.40  
% 3/4 1 to 1 1/4 inch.  
\$3.35 3.30 3.25 3.25 per 100 lb.  
German Coil... 60¢@10¢@70%

### Halters and Ties—

Halter Chains... 60¢@10¢@70%  
German Pattern Halters... 60¢@10¢@70%  
List July 24, '97... 60¢@10¢@70%  
Cow Ties... 60¢@10¢@70%

### Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.  
6 1/2-6-3, Str'ght, with ring \$23.50  
6 1/2-6-2, Str'ght, with ring \$24.50  
6 1/2-6-2, Str'ght, with ring \$28.00  
6 1/2-10-2, Str'ght, with ring \$32.00  
NOTE—Add 2¢ per pair for Hooks.  
Twist Traces 2¢ per pair higher than Straight Link.

### Trace, Wagon and Fancy

Chains... 60¢@10¢@70%

### Miscellaneous—

Jack Chain, list July 10, '93:  
Iron... 60¢@10¢@70%  
Brass... 60¢@10¢@70%  
Safety Chain... 75¢@10¢@70%  
Gal. Pump Chain... 1.50@1.75  
Covert Mfg. Co.:  
Breast... 35¢  
Halter... 35¢  
Heel... 35¢  
Rein... 35¢  
Stallion... 35¢  
Covert Sad. Works:  
Breast... 70¢  
Halter... 70¢  
Hold Back... 70¢  
Rein... 70¢  
Oneda Community:  
Am. Coil and Halters... 40¢@10¢@70%  
Am. Cow Ties... 45¢@10¢@70%  
Eureka Coil and Halter... 45¢@10¢@70%  
Niagara Coil and Halter... 45¢@10¢@70%  
Niagara Cow Ties... 45¢@10¢@70%  
Niagara Wire Dog Chains... 45¢@10¢@70%  
Wire Goods Co.:  
Dog Chain... 70¢@10¢@70%  
Universal Dbl. Jointed Chain... 60¢

### Chalk—(From Jobbers.)

Carpenters' Blue... gro. 35¢@38¢  
Carpenters' Red... gro. 30¢@33¢  
Carpenters' White... gro. 25¢@28¢  
See also Crayons.

### Checks, Door—

Bardsley's... 45¢  
Columbia... 50¢@10¢  
Eclipse... 60¢@10¢

### Chests, Tool—

American Tool Chest Co.:  
Roy's Chests, with Tools... 55¢  
Youth's Chests, with Tools... 40¢  
Gentlemen's Chests, with Tools... 30¢  
Farmers' Carpenters', etc., Chests, with Tools... 20¢  
Machinists' and Pipe Fitters' Chests, Empty... 50¢  
Tool Cabinets... 50¢  
C. E. Jennings & Co.'s Machinists' Tool Chests... 35¢@10¢

### Chisels—

#### Socket Framing and Firmer

Standard List... 75¢@75¢@10%  
Buck Bros... 30¢  
Charles Buck... 30¢  
C. E. Jennings & Co. Socket Firmer... 50¢  
C. E. Jennings & Co. Socket Framing No. 15... 60¢  
Ohio Tool Co.'s... 70¢  
Swan's... 70¢  
L. & I. J. White... 30¢@30¢@5%

### Tanged—

Tanged Firmers, 32 1-3@33 1-3@10%  
Buck Bros... 30¢  
Charles Buck... 30¢  
C. E. Jennings & Co. Nos. 191, 181... 25¢  
L. & I. J. White, Tanged... 25¢

### Cold—

Cold Chisels, good quality... 13¢@15¢  
Cold Chisels, fair quality... 11¢@12¢  
Cold Chisels, ordinary... 9¢@10¢

### Chucks—

Beach Pat., each \$3.00... 35¢  
Pratt's Positive Drive... 25¢  
Empire... 25¢  
Blacksmiths... 25¢  
Skinner Patent Chucks... 50¢  
Independent Lathe Chucks... 50¢  
Universal... 50¢  
Combination... 50¢  
Drill Chucks, New Model... 30¢  
Drill Chucks, Standard... 45¢  
Drill Chucks, Skinner Pat., 0, 1, 2, 3, 5, 6, 7, 8... 30¢  
Drill Chucks, Positive Drive... 30¢  
Planer Chucks... 25¢  
Face Plate Jaws... 40¢  
Standard Tool Co.:  
Improved Drill Chuck... 45¢  
Union Mfg. Co.:  
Combination... 50¢  
Czar Drill... 35¢  
Combination Geared Scroll... 40¢  
Geared Scroll... 40¢  
Independent Steel... 40¢  
Union Drill... 45¢  
Universal... 40¢  
Independent Iron F. Plate Jaws... 50¢  
Independent Steel F. Plate Jaws... 40¢  
Westcott Patent Chucks... 50¢  
Lathe Chucks... 50¢  
Little Giant Auxiliary Drill... 50¢  
Little Giant Double Grip Drill... 50¢  
Little Giant Drill, Improved... 50¢  
Oneda Drill... 50¢  
Scroll Combination Lathe... 50¢

### Clamps—

Adjustable, Hammers... 20¢  
Cabinet, Sargent's... 10¢  
Carriage Makers, P. S. & W. Co... 60¢  
Carriage Makers, Sargent's... 60¢  
Besly, Parallel... 33¢@10¢  
Lineman's, Utica Drop Forge & Tool Co... 40¢  
Saw Clamps, see Vises, Saw Filers.

### Cleaners, Drain—

Iwan's Champion, Adjustable... 55¢  
Iwan's Champion, Stationary... 45¢

### Sidewalk—

Star Socket, All Steel... 30¢  
Star Shank, All Steel... 30¢  
W. & C. Shank, All Steel... 30¢  
7 1/2 in., \$3.00; 8 in., \$3.25.

### Cleavers, Butchers—

Foster Bros... 30¢  
New Haven Edge Tool Co.'s... 45¢  
Fayette R. Plumb... 33¢@33¢@10%  
L. & I. J. White... 30¢

### Clippers—

Chicago Flexible Shaft Company:  
'98 Chicago Horse... 15¢  
1902 Chicago Horse... 10¢  
20th Century Horse, each... 20¢  
Lightning Belt... 15¢  
Chicago Belt... 15¢  
Stewart's Patent Sheep... 20¢

### Finger Nail Clippers—

Smith & Hemenway Co. 1/2 doz. net \$2.00

### Clips, Axle—

Eagle, 5-16 and 3/4 in. 75¢@75¢@10%  
Norway, 5-16 and 3/4 in. 60¢@10¢@70%

### Cloth and Netting, Wire

—See Wire, &c.

### Cocks, Brass—

Hardware List:  
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks... 70¢@10¢@75%

### Coffee Mills—

See Mills, Coffee.

### Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list... 40¢  
Leather, Walter B. Stevens & Son's list... 40¢

### Combs, Curry—

Metal Stamping Co... 40¢

### Mane and Tail—

Covert's Saddlery Works... 60¢@10%

### Compasses, Dividers, &c.

Ordinary Goods... 75¢@75¢@10%  
Hemis & Call Hdw. & Tool Co.:  
Calipers, Double... 60¢  
Calipers, Inside or Outside... 60¢  
Calipers, Wing... 60¢  
Compasses... 50¢

### Conductor Pipe, Galva.—

L. C. L. to Dealers:  
Territory, Nested, Not nested.  
A. Eastern... 75¢  
B. Eastern... 75¢  
Central... 75¢  
Southern... 70¢@10¢  
S. Western... 70¢  
Terms, 60 days; 2% cash 10 days.  
Factory shipments generally delivered.  
See also Eave Troughs.

### Coolers, Water—

Gal., each... 2 3 4 6 8  
Labrador... \$1.20 \$1.50 \$1.80 \$2.10 \$2.70  
Gal... 3 6 8  
Iceland, ea... \$1.80 \$2.10 \$2.40 \$3.00  
Gal... 3 4 6 8  
Galv. Lined, ea... \$1.85 \$2.00 \$2.25 \$2.50 \$3.00  
Garl. Lined, side handles,  
Gal... 2 3 4 6 8  
Each... \$1.95 \$2.15 \$2.40 \$3.30 \$4.15. 25%

### Coopers' Tools—

See Tools, Coopers'.

### Cord—

Sash—

Braided, Drab... 1b. 35¢  
Braided White, Com. lb. 21¢@22 1/2¢  
Cable Laid Italian... 1b. A, 18¢; B, 16¢  
Common India... 1b. 10¢@10 1/2¢  
Cotton Sash Cord, Twisted... 11¢@11 1/2¢  
Patent Russia... 1b. 14¢  
Cable Laid Russia... 1b. 15¢  
India Hemp, Braided... 1b. 18¢  
India Hemp, Twisted... 1b. 12¢@13¢  
Patent India, Twisted... 1b. 12¢@13¢  
Anniston Cordage Co.: Braided Cotton, Old Glory, Nos. 7 to 12... 1b. 28¢  
Anniston, Nos. 7 to 12... 1b. 22¢  
Old Colony, Nos. 7 to 12... 1b. 22¢  
Anniston Drab, Nos. 7 to 12... 1b. 26¢  
Pearl Braided, cotton, No. 6... 1b. 25¢  
25¢; No. 7, 21¢; No. 8 to 12, 21¢  
Eddystone Braided, Nos. 7, 8, 9 and 10... 1b. 24¢  
Eddystone Braided Cotton, No. 8... 1b. 25¢  
Harmony Cable Laid Italian, Nos. 7 to 10... 1b. 23¢  
Pearless... 1b. 23¢  
Cable Laid Italian... 14¢  
Cable Laid Russian... 14¢  
Cable Laid India... 12¢  
Braided India... 15¢  
Samson, Nos. 8 to 12... 1b. 40¢  
Braided, Drab Cotton... 1b. 40¢  
Braided, Italian Hemp... 1b. 40¢  
Braided, Linen... 1b. 55¢  
Braided, White Cotton or Spot... 1b. 35¢  
Massachusetts, White... 1b. 35¢  
Massachusetts, Drab... 1b. 32¢  
Phoenix, White, Nos. 8 to 12, 21¢; No. 7, 24¢; No. 6, 25¢.  
Silver Lake:  
A quality, Drab... 40¢  
A quality, White... 40¢  
B quality, Drab... 35¢  
B quality, White... 30¢  
Italian Hemp... 40¢  
Linen... 57 1/2¢

### Wire, Picture—

List Oct., '00... 85¢@10¢@10¢@10¢@10¢@5%  
Hendryx Standard Wire Picture Cord... 85¢@10¢@5%

### Cradles—

Grain... 40¢@12 1/2%

### Crayons—

White Round Crayons, gr. 5 1/2¢@6¢  
Cases, 100 gro., \$4.00; at factory.  
D. M. Steward Mfg. Co.:  
Jumbo Crayons... gr. 33¢  
Metal Workers' Crayons, gr. 25¢  
Soapstone Pencils, round, flat square... gr. 15¢  
Rolling Mill Crayons... gr. 25¢  
Railroad Crayons (composition)... gr. 22¢  
Zelnicer's Lumber:  
Red, Blue, Green... 30¢  
See also Chalk.

### Crooks, Shepherds—

Fort Madison, Heavy... 30¢  
Fort Madison, Light... 30¢

### Crow Bars—See Bars, Crow.

### Cultivators

Victor Garden... 50%

### Cutlery, Table—

International Silver Company:  
No. 12 M'd'm Knives, 1817... 30¢  
Star, Eagle, Rogers & Hamilton and Anchor... 30¢  
Wm. Rogers & Son... 30¢

### Cutters—

H. H. Mayhew Co... 40¢  
Red Devil... 50¢  
Smith & Hemenway Co... 50¢  
Woodward... 40%

### Meat and Food—

American... 30¢  
Nos... 1 2 3 4 11 5  
Each... \$5 \$7 \$10 \$25 \$50 \$60  
Enterprise... 25¢@7 1/2¢  
Nos... 12 22 22 22  
Each... \$2 \$3 \$2.75 \$1.50 \$6  
Dixon's... 30¢  
Ideal... 14¢  
Little Giant... 30¢  
Nos... 305 310 312 320 322  
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00  
N. E. Food Choppers... 40¢  
New Triumph No. 605... 40¢  
Russwin Food, No. 1, 234.00; No. 2, \$27.00... 45¢@10¢@10¢  
Woodruff's... 30¢  
Nos... 100 150  
Enterprise Beef Shavers... 25¢@30%

### Slaw and Kraut—

Henry Diston & Sons:  
Kraut Cutters, 24 x 7, 28 x 8, 30 x 9... 55¢  
Kraut Cutters, 36 x 12, 48 x 12... 40¢  
J. M. Mast Mfg. Co.:  
Slaw Cutters, 1 Knife... 30¢  
Combined Slaw Cutter and Corn Grater... 40¢  
Tucker & Dorsey Mfg. Co.:  
Kraut Cutters... 40¢  
Slaw Cutters, 1 Knife... 30¢  
Slaw Cutters, 2 Knife... 30¢

### Tobacco—

All Iron, Cheap... doz. \$4.25@4.50  
Enterprise... 30¢  
National, 1/2 doz., No. 1, 21¢; No. 2, 18¢  
Sargent's, 1/2 doz., No. 2, 21¢  
Sargent's, Nos. 12 and 21... 60¢@10%

### Washer—

Appleton's, 1/2 doz., \$16.00... 50¢@10¢@10%

### Diggers, Post Hole, &c.—

Dalbey Post Hole Auger, per doz. \$9.00  
Iwan's Improved Post Hole Auger... 40¢  
Iwan's Vaughan Pattern Post Hole Augers... 30¢  
Iwan's Perfection Post Hole Digger... 30¢  
Iwan's Split Handle Post Hole Diggers... 30¢  
Kohler's Universal... 30¢  
Kohler's Little Giant... 30¢  
Kohler's Hercules... 30¢  
Kohler's Invincible... 30¢  
Kohler's Rival... 30¢  
Kohler's Pioneer... 30¢  
Never-Break Post Hole Diggers... 30¢  
Samson, 1/2 doz. \$34.00... 25%

### Dividers—See Compasses.

### Doors, Screen—

Phillips', style E, 3/4 in... 30¢  
Phillips', style 077, 3/4 in... 30¢  
Phillips', style x-y, 3/4 in... 30¢

### Drawers, Money—

Tucker's Pat. Alarm Till No. 1, 3/4 doz., \$18; No. 2, \$15; No. 3, \$12; No. 4, \$18.

### Drawing Knives—

See Knives, Drawing.

### Dressers, Emery Wheel—

Diamond Emery Wheel Dressers... 35¢  
Diamond Wheel Dresser Cutters... 35¢

### Drills and Drill Stocks—

Common Blacksmiths' Drill, each... \$1.50@1.75  
Breast, Millers Falls... 15¢  
Breast, P. S. & W... 40¢  
Goodell Automatic Drills... 40¢  
Johnson's Automatic Drills, Nos. 2 and 3... 16¢  
Johnson's Drill Points... 16¢  
Millers Falls Automatic Drills... 40¢  
Ratchet, Curtis & Curtis... 25¢  
Ratchet, Parker's... 40¢  
Ratchet, Weston's... 35¢  
Ratchet, Whitney's, P. S. & W... 50¢  
Whitney's Hand Drill, No. 1, \$10.00; Adjustable, No. 10, \$12.00... 35%

### Twist Drills—

Bit Stock... 60¢@10¢@70%

### Drivers, Screw—

Screw Driver Bits, per doz. 45¢@60¢  
Balsey's Screw Holder and Driver... 30¢  
Balsey's, 2 1/2-in., \$6; 4-in., \$7.50; 6-in., \$9  
Buck Bros' Screw Driver Bits... 40¢  
Champion... 50¢  
Edson... 60¢  
Fray's Hol. H'dle Sets No. 3, \$12.50  
Gay's Double Action Ratchet... 35¢  
Goodell's Auto... 50¢@10¢@50¢@10¢@50¢  
Hurwood... 40¢  
Mayhew's Black Handle... 40¢  
Mayhew's Monarch... 40¢  
Millers Falls, Nos. 20 and 21... 25¢  
Millers Falls, Nos. 11, 12, 41, 42... 15¢  
Never Turn... 60¢  
New England Specialty Co... 50¢  
Sargent & Co.:  
Nos. 1 and 60... 50¢@10¢@10%  
Nos. 50 and 55... 60¢  
Nos. 20 and 40... 70¢  
Smith & Hemenway Co... 40¢  
H. D. Smith & Co.'s Perfect H'dle... 40¢  
Stanley R. & L. Co.'s:  
No. 64, Varn. Handles... 65¢  
No. 56... 75¢  
Victor... 55¢  
Defiance... 70¢  
Swan's:  
Nos. 65 to 68... 50¢  
No. 40... 40¢  
Nos. 25, 35 and 45... 20¢@10¢@10%

### Eave Trough, Galvanized—

Territory, L. C. L.  
A, Eastern... 80¢@7 1/2¢  
B, Eastern... 80¢@12 1/2¢  
Central... 80¢@7 1/2¢  
Southern... 70¢@20¢@10¢  
S, Western... 75¢@12 1/2¢  
Terms—2% for cash. Factory shipments generally delivered.  
See also Conductor Pipe and Elbows.

### Elbows and Shoes—

Factory shipments:  
Galv. Steel and Galv. O. C.  
Iron or Tin... 60¢@10%  
Copper... 37 1/2¢  
Perfect Elbows (S., S. & Co.)... 40%

### Emery, Turkish—

40 to 55 to 180 Flour  
Kegs... 1b. 5¢ 5 1/2¢ 5 3/4¢ 3 1/2¢  
1/2 Kegs... 1b. 5 1/2¢ 5 1/4¢ 5 1/2¢ 4¢  
10-lb. cans,  
10 in case... 6 1/2¢ 7¢ 6¢  
10-lb. cans, less  
than 10... 10¢ 10¢ 8¢  
Less quantity... 10¢ 10¢ 8¢  
NOTE—In lots 1 to 3 tons a discount of 10% is given.

### Extractors, Lemon Juice

—See Squeezers, Lemon.

### Fasteners, Blind—

Zimmerman's... 50¢@10%

### Cord and Weight—

Ives... 40%

**Faucets—**

Cork Lined.....	50¢@50¢10%
Metallic Key, Leather Lined.....	60¢10¢70%
Red Cedar.....	40¢10¢50%
Petroleum.....	70¢10¢75%
B. & L. B. Co.:.....	60¢10%
Metal Key.....	60¢10%
Star.....	50¢10%
West Lock.....	50¢10%
John Sommer's Peerless Tin Key.....	40¢
John Sommer's Boss Tin Key.....	50¢
John Sommer's Victor Mt. Key.....	50¢10%
John Sommer's Duplex Metal Key.....	60¢
John Sommer's Diamond Lock.....	40¢
John Sommer's 1 X L Cork Lined.....	50¢
John Sommer's Reliable Cork Lined.....	50¢10%

John Sommer's Chicago Cork Lined.....	60¢
John Sommer's O. K. Cork Lined.....	50¢
John Sommer's No Brand, Cedar.....	50¢
John Sommer's Perfection, Cedar.....	40¢
McKenna, Brass:	
Burglar Proof, N. P.....	25¢
Improved, ¾ and 1 inch.....	25¢
Self Measuring.....	40¢10%
Enterprise, ¾ doz.....	36¢00
Lane's, ¾ doz.....	36¢00
National Measuring, ¾ doz.....	36¢00

**Felice Plates—**

See Plates, Felice.

**Files— Domestic—**

List revised Nov. 1, 1899.

Best Brands.....	70¢10¢75¢5%
Standard Brands.....	75¢10¢75¢10¢10%
Lower Grade.....	75¢10¢10¢80¢10%

**Imported—**

Stubs' Tapers, Stubs' List, July 24, '97.....	33 1-3¢40%
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**Fixtures, Fire Door—**

Richards Mfg. Co.:.....	\$4.00
Universal, No. 103.....	\$4.00
Special, No. 104.....	\$4.00
Fusible Links.....	\$0.25
Expansion Bolts.....	50¢10%

**Grindstone—**

Net Prices:	
Inch.....	15 17 19 21 24
Per doz.....	\$2.15 2.85 3.25 3.75 4.50
P. S. & W. Co.....	30¢10¢40%
Reading Hardware Co.....	70¢
Sargent's.....	70¢
Stowell's Giant Grindstone Hanger.....	¾ doz. \$6.00
Stowell's Grindstone Fixtures, Extra Heavy.....	50¢10¢10%
Stowell's Grindstone Fixtures, Light.....	60¢10%

**Fodder Squeezers—**

See Compressors.

**Forks—**

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato.....	60¢10%
Victor, Hay.....	60¢15¢25%
Victor, Manure.....	60¢
Victor, Header.....	60¢
Champion, Hay.....	60¢
Champion, Header.....	60¢15¢25%
Champion, Manure.....	60¢20%
Columbia, Hay.....	70¢12%
Columbia, Manure.....	70¢12%
Hawkeye Wood Barley.....	40¢
W. & C. Potato Digger.....	60¢10%
Acme Hay.....	60¢20%
Acme Manure, 4 tine.....	60¢10¢5%
Dakota Header.....	60¢20%
Jackson Steel Barley.....	60¢20%
Kansas Header.....	60¢
W. & C. Favorite Wood Barley.....	40¢
Plated—See Spoons.	

**Frames— Saw—**

White, 8' g't Bar, per doz.....	75¢80¢
Red, 8' g't Bar, per doz.....	\$1.00¢1.25
Red, Dbl. Brace, per doz.....	\$1.40¢1.50

**Freezers, Ice Cream—**

Qt. ....	1 2 3 4 6
Each.....	\$1.30 \$1.60 \$1.90 \$2.20 \$2.80

**Fruit and Jelly Presses—**

See Presses, Fruit and Jelly.

**Fry Pans—See Pans, Fry.****Fuse—**

Per 1000 Feet.	
Hemp.....	\$2.75
Cotton.....	3.20
Waterproof Sgl. Taped.....	3.65
Waterproof Dbl. Taped.....	4.40
Waterproof Tpl. Taped.....	5.15

**Gates, Molasses and Oil—**

Stebbins' Pattern.....	80¢10¢80¢10¢5%
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**Gauges—**

Marking, Mortise, &c.....	50¢10¢50¢10¢10¢5%
Chapin-Stephens Co.:.....	
Marking, Mortise, &c.....	50¢10¢50¢10¢10%
Scholl's Patent.....	50¢10¢50¢10¢10%
Door Hangers.....	50¢10¢10%
Stanley R. & L. Co.'s Butt and Rabbit Gauge.....	35¢
Marking and Mortise.....	40¢
Wire, Brown & Sharpe's.....	25¢
Wire, Morse's.....	25¢
Wire, P. S. & W. Co.....	30¢10%

**Gimlets— Single Cut—**

Numbered assortments, per gro.

Nail, Metal, No. 1.....	\$2.00; 2. \$2.30
Spike, Metal, No. 1.....	\$4.00; 2. \$4.30
Nail, Wood Handled, No. 1.....	\$2.30; 2. \$2.60
Spike, Wood Handled, No. 1.....	\$4.30; 2. \$4.60

**Glass, American Window**

See Trade Report.

**Glasses, Level—**

Chapin-Stephens Co.....	60¢60¢10¢10%
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**Glue, Liquid Fish—**

Bottles or Cans, with Brush.....	25¢150%
Cans (½ pts., pts., qts., ½ gal., gal.).....	25¢48%
International Glue Co. (Martin's).....	40¢10%

**Grease, Axle—**

Common Grade.....	gro. \$4.50¢55¢
Dixon's Everlasting.....	10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes.....	per doz. 1 lb, \$1.20; 2 lb, \$2.00

**Grips, Nipple—**

Perfect Nipple Grips.....	40¢10¢2%
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**Griddles, Soapstone—**

Pike Mfg. Co.....	33½¢33½¢10%
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**Grindstones—**

Bicycle Emery Grinder.....	\$6.50
Bicycle Grindstones, each.....	\$2.50¢3.00
Pike Mfg. Co.:.....	
Improved Family Grindstones.....	per inch, ¾ doz.....\$2.00
Pike Mower and Tool Grinder.....	each.....\$1.00
Velox Ball Bearing, Mounted Angle Iron Frames, each.....	\$3.25

**Halters and Ties—**

Covert Mfg. Co.:.....	
Web.....	35¢5%
Jute Rope.....	50%
Sisal Rope.....	40¢10%
Cotton Rope.....	45%
Hemp Rope.....	45%
Covert's Saddlery Works:	
Web and Leather Halters.....	70%
Jute and Manila Rope Halters.....	70%
Sisal Rope Halters.....	60¢20%
Ties, Manila and Cotton Rope.....	70%
Sisal Rope Ties.....	60¢10%
E. T. Rugg & Co.:.....	
Web Halters and Webbing.....	60%
Jute and Sisal Rope Halters.....	60%
Jute and Sisal Horse and Cattle Ties.....	60%
Cotton Horse Ties.....	60%
Livery Ties, Braided.....	60%

**Hammers—****Handled Hammers—**

Heller's Machinists'.....	40¢10¢40¢10¢10%
Heller's Farriers.....	40¢10¢40¢10¢10%
Magnetic Tack, Nos. 1, 2, 3.....	\$1.25
Peck, Stow & Wilcox.....	40¢10¢5%
Payette R. Plumb:	
Plumb, A. E. Nail.....	33½¢7½¢33½¢10¢7½%
Engineers' and R. S. Hand.....	50¢15¢30¢10¢7½%
Machinists' Hammers.....	50¢50¢10¢5%
Riveting and Tinner's.....	40¢2½¢40¢10¢2½%
Sargent's C. S. New List.....	40%

**Heavy Hammers and Sledges—**

Under 3 lb., per lb.....	50¢
3 to 5 lb., per lb.....	40¢
Over 5 lb., per lb.....	30¢
Wilkinson's Smiths'.....	1 lb. 9½¢10¢

**Handles—**

Agricultural Tool Handles	
Axe, Pick, &c.....	60¢5¢60¢10¢5%
Hoe, Rake, &c.....	45¢10¢5%
Fork, Shovel, Spade, &c.....	45¢50¢5%
Long Handles.....	45¢50¢5%
D Handles.....	40%
Cross-Cut Saw Handles—	
Atkins.....	40¢5%
Champion.....	45¢45¢10%
Diston's.....	50%

**Mechanics' Tool Handles—**

Auger, assorted.....	gro. \$2.50¢\$2.85
Brad Axl.....	gro. \$1.65¢\$1.85
Chisel Handles:	
Apple Tanged Firmer, gro. assorted.....	\$2.40¢\$2.65
Hickory Tanged Firmer, gro. assorted.....	\$2.15¢\$2.40
Apple Socket Firmer, gro. assorted.....	\$1.75¢\$1.95
Hickory Socket Firmer, gro. assorted.....	\$1.45¢\$1.60
Hickory Socket Framing, gro. assorted.....	\$1.60¢\$1.75
File, assorted.....	gro. \$1.30¢\$1.40
Hammer, Hatchet, Axe, &c.....	60¢10¢60¢10¢10%
Hand Saw, Varnished, doz.....	80¢85¢; Not Varnished.....65¢75¢
Plane Handles:	
Jack, doz.....	90¢; Jack, Bolted.....75¢
Fore, doz.....	45¢; Fore, Bolted.....90¢
Chapin-Stephens Co.:.....	
Chiseling Tool.....	40¢10¢10%
Chisel.....	65¢65¢10%
File and Awl.....	65¢65¢10%
Saw and Plane.....	40¢40¢10%
Screw Driver.....	40¢40¢10%
Millers Falls Adj. and Ratchet Auger Handles.....	15¢10%
Nicholson Simplicity File Handle.....	per gro. \$0.85¢\$1.50

**Hangers—**

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.	
Barn Door, New Pattern, Round Groove, Regular:	
Inch.....	3 4 5 6 8
Single Doz.....	\$0.90 1.25 1.60 1.95 2.50

**Barn Door, New England Pat-**

tern, Check Back, Regular:

Inch.....	3 4 5 6
Single Doz.....	\$1.30 1.55 2.50 3.60

**Allith Mfg. Co.:.....**

Reliable, No. 1.....	per doz. \$8.00
Reliable, No. 2.....	per doz. \$9.00

**Chicago Spring Butt Co.:.....**

Friction.....	25%
Oscillating.....	25%
Big Twin.....	25%

**Chisholm & Moore Mfg. Co.:.....**

Baggage Car Door.....	50%
Elevator.....	30%
Railroad.....	30%

**Cronk & Carrier Mfg. Co.:.....**

Loose Axle.....	60¢10¢5%
Roller Bearing.....	75¢5%

**Griffin Mfg. Co.:.....**

Solid Axle, No. 10.....	\$12.00
Roller Bearing, No. 11.....	\$15.00
Roller Bearing, Ex. Hy., No. 22.....	\$18.00
Hinged Hangers.....	\$16.00

**Lane Bros. Co.:.....**

Parlor Ball Bearing.....	\$4.00
Parlor, Standard.....	\$3.15
Parlor, No. 105.....	\$2.85
Parlor, New Model.....	\$2.80
Parlor, New Champion.....	\$2.25
Barn Door, Standard.....	\$6.10
Hinged.....	net \$6.40
Covered.....	60¢10%
Special.....	70¢5%

**Lawrence Bros.:.....**

Advance.....	60¢10%
Cleveland.....	70%
Clipper, No. 7.....	60%
Crown.....	60¢10%
Easy Parlor Door, Dbl. Sets.....	\$2.50; Single Sets, \$1.25
Giant.....	60¢5%
Hummer.....	70¢5%
New York.....	60¢10%
Peerless.....	70¢5%
Sterling.....	60¢10%

**McKinney Mfg. Co.:.....**

No. 1, Special.....	60¢10%
No. 2, Standard.....	60¢10%
Hinged Hangers.....	60%
Meyers' Stayon Hangers.....	60%

**Richards Mfg. Co.:.....**

Pioneer Wood Track No. 3.....	\$2.15
Roller B'r'g St'l Track No. 10.....	\$2.40
Roller B'r'g St'l Track No. 12.....	\$2.30
Roller B'r'g St'l Track No. 13.....	\$2.40
Roller B'r'g St'l Track No. 14.....	\$2.30
Hero, Adj. Track No. 19.....	50%
Adjustable Track Tandem Trolley Track No. 16.....	50%
Seal Steel Track No. 8.....	\$2.40
Auto. Adj. Track No. 25.....	40¢10%
Trolley B. D. No. 17.....	\$1.40
Trolley F. D. No. 120.....	\$2.35
Trolley F. D. No. 121.....	\$2.45
Trolley F. D. No. 150.....	\$2.60
Safety Underwriters F. D. No. 101.....	\$2.25
Tandem No. 44.....	70¢5%
Trolley F. D. No. 151.....	\$3.00
Palace, Adjustable Track No. 132.....	40¢10%
Regal, Adjustable Track.....	40¢10%
Ives' Wood Track No. 1.....	\$2.15
Trolley B. D. No. 20.....	\$1.35
Trolley B. D. No. 21.....	\$1.45
Trolley B. D. No. 27.....	\$1.50
Trolley B. D. No. 28.....	\$1.66
Roller Bearings Nos. 39, 40, 41.....	40¢10%
43, 44.....	70¢5%
Anti-friction No. 42.....	60¢10%
Hinged Tandem No. 48.....	60%
Folding Door B. B. Swivel No. 155.....	60%

**Safety Door Hanger Co.:.....**

Storm King Safety.....	60%
U. S. Standard Hinge.....	60%

**Stowell Mfg. & Foundry Co.:.....**

Acme Parlor Ball Bearing.....	40%
Acme Hinge.....	60%
Apex Parlor Door.....	50¢10¢5%
Atlas.....	60%
Baggage Car Door.....	50%
Climax Anti-Friction.....	50¢10%
Elevator.....	40%
Express.....	60%
Freight Car Door.....	60%
Interstate.....	60¢10%
Lundy Parlor Door.....	50¢10%
Magic.....	60%
Matchless.....	60¢10%
Nansen.....	70¢5%
Parlor Door.....	50¢10%
Railroad.....	50¢10%
Rex Hinge Door.....	60%
Street Car Door.....	50%
Steel, Nos. 300, 400, 500.....	50¢10%
Underwriters' Fire Door.....	40%
Wild West Warehouse Door.....	50%
Zenith for Wood Track.....	50¢10%

**A. L. Sweet Iron Works:.....**

Check Back.....	70%
Climax Anti-Friction.....	50¢10%
Engle.....	70%
Hylo Hinge.....	60%
New Perfection.....	60%
Pilot.....	60%
Pilot Hinge.....	60%
Rider Pattern.....	65%
Taylor & Borgia F'y Co.'s Kidder's Roller Bearing.....	50¢15¢10¢5%
Wilcox Mfg. Co.:.....	
Bike Roller Bearing.....	60¢10%
J. Roller Bearing.....	60¢10%
Cycle Ball Bearing.....	50%
Dwarf Ball Bearing.....	40%
Ives, Wood Track.....	60¢10%
L. T. Roller Bearing.....	60¢10¢5%
New Era Roller Bearing.....	50¢10%
O. K. Roller Bearing.....	80¢10¢5%
Prindle, Wood Track.....	60%
Richards' Wood Track.....	60%
Richards' Steel Track.....	50¢10%
Spencer Roller Bearing.....	60¢10%
Tandem, Nos. 1 and 2.....	60%
Underwriters' Roller Bearing.....	40%
Wilcox Auditorium Ball B'r'g.....	20%
Wilcox Barn Trolley No. 123.....	40%
Wilcox Elev. Door, Nos. 112 and 122.....	50%
Wilcox Elev. Door, No. 132.....	40%
Wilcox Fire Trolley, Roller Bearing.....	30%
Wilcox Le Roy Noiseless Ball Bearing.....	40%
Wilcox New Century.....	50¢10¢10%
Wilcox O. K. Steel Track.....	50%
Wilcox O. K. Trolley.....	40%
Wilcox Trolley Ball Bearing.....	40%
Wilcox Wideman Narrow Gauge.....	40%
For Track, see Rail.	

**Hangers— Garment—**

Pullman Trouser, ¾ gro., No. 1.....	\$9.00;
No. 4.....	\$24.00; No. 7, \$7.50
Victor Folding.....	¾ gro. \$9.60
Western, W. G. Co.....	70¢10%

**Gate—**

Myers' Patent Gate Hangers, ¾ doz.
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### Wrought Iron Hinges—

Strap and T Hinges, &c., list  
December 20, 1904:

Light Strap Hinges.....	70%	Extra	10/1045%
Heavy Strap Hinges.....	75%		
Light T Hinges.....	65%		
Heavy T Hinges.....	60%		
Extra H T Hinges.....	70%		
Hinge Hinges.....	30%		
Cor. Heavy Strap.....	75%		
Cor. Ex. Heavy T.....	75%		
Screw Hook.....	10 to 12 in. 1b. 3 1/2¢		
and Strap.....	1 1/2 to 20 in. 1b. 3 1/2¢		
	22 to 36 in. 1b. 3¢		
Screw Hook and Eye.....	3/4 to 1 inch..... 1b. 6¢		
	1 to 1 1/2 inch..... 1b. 7¢		
	1 1/2 inch..... 1b. 9¢		

### Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers.....35%

### Hods— Coal—

Inch.....	15	16	17	18
Galv. Open.....	\$2.50	2.75	3.00	3.25
Jap. Open.....	\$1.90	2.10	2.25	2.55
Galv. Funnel.....	\$3.00	3.30	3.60	3.90
Jap. Funnel.....	\$2.45	2.65	2.85	3.30

### Masons, Etc.—

Cleveland Wire Spring Co.:  
Steel Mortar.....each \$1.45  
Steel Brick.....each \$1.10

### Hoes— Eye—

Scovill and Oval Pattern.....  
60¢ to 10¢ to 60¢ to 10¢

Grub, list Feb. 23, 1899.....  
70¢ to 10¢ to 75¢ to 10¢

D. & H. Scovill.....35%

### Handled—

NOTE.—Manufacturers are  
selling from the list of September  
1, 1904, but many jobbers are still  
using list of August 1, 1899, or  
selling at net prices.

Ft. Madison Cotton Hoe.....70¢ to 10¢

Ft. Madison Crescent Cultivator Hoe.....  
70¢ to 10¢

Ft. Madison Mattock Hoe.....  
70¢ to 10¢

Regular Weight.....doz. 66%

Junior Size.....doz. \$4.00

Ft. Madison Sprouting Hoe.....doz. 50%

Ft. Madison Dixie Tobacco Hoe.....  
75¢ to 10¢ to 75¢ to 10¢

Kretzinger's Cut Easy.....70¢ to 10¢

Warren Hoe.....75¢ to 10¢

W. & C. Ivins.....75¢ to 10¢

B. B. 6 in. Cultivator Hoe.....\$3.15

B. B. 6 1/2 in. ....3.35

Acme Wedding.....doz. net, \$4.35

W. & C. L'ning Shuffle Hoe.....doz. \$4.85

### Hoisting Apparatus—

See Machines, Hoisting.

### Holders— Bit—

Angular, 7/8 doz. \$24.00.....45¢ to 10¢

### Door—

Bardsley's.....45%

Empire.....50%

Pullman.....50%

### File and Tool—

Nicholson File Holders and File  
Handles.....33 1/2 to 40%

### Fruit Jar—

Triumph Fruit Jar Holder, 7/8 gross,  
\$10.80; 7/8 doz. ....\$1.25

### Hooks—Cast Iron—

Bird Cage, Reading.....40%

Bird Cage, Sargent's List.....60¢ to 10¢

Ceiling, Sargent's List.....50¢ to 10¢

Clothes Line, Reading List.....40%

Clothes Line, Sargent's List.....50¢ to 10¢

Coat and Hat, Sargent's List.....50¢ to 10¢

Clothes Line, Stowell's.....70%

Coat and Hat, Reading.....45¢ to 20¢

Coat and Hat, Stowell's.....70%

Coat and Hat, Wrightsville.....40%

Harness, Reading List.....60%

Harness, Stowell's.....60%

School House, Stowell's.....70%

### Wire—

Belt.....80¢ to 10¢ to %

Wire C. & H. Hooks.....75¢ to 10¢ to 75¢ to 10¢

Atlas, Coat and Hat.....75%

Single Cases.....75% to 10%

10 Case Lanes.....75% to 10%

Columbian Hdw. Co., Gem.....60¢ to 10%

Parker Wire Goods Co., King.....75% to 10%

Van Wagoner Coat and Hat.....70%

Western W. G. Co., Molding.....75%

Wire Goods Co.:  
Acme.....60¢ to 10%

Chief.....70%

Crown.....70% to 10%

Czar.....65%

Czar.....70% to 10%

Czar.....50% to 10%

### Wrought Iron—

Box, 6 in., per doz., \$1.00; 8 in.,  
\$1.25; 10 in., \$2.50.

Cotton.....doz. \$1.05 to \$1.25

Wrought Staples, Hooks, &c.....  
See Wrought Goods.

### Miscellaneous—

Hooks, Bench, See Stops, Bench.

Bush, Light, doz. \$1.75; Medium,  
\$5.35; Heavy, \$6.25

Grass, best, all sizes, per doz. \$1.50

Grass, common grades, all sizes,  
per doz. ....\$1.30

Whiffletree.....lb. 5 1/4 to 6¢

Hooks and Eyes:  
Brass.....60¢ to 10¢ to 60¢ to 10%

Malleable Iron.....70¢ to 10¢ to 70¢ to 10%

Covert Mfg. Co. Gate and Scuttle  
Hooks.....

Covert Saddlery Works Self Locking  
Gate and Door Hook.....60%

Ft. Madison Cut-Easy Corn Hooks,  
7/8 doz. \$3.25 net

nch Hooks—See Bench Stops.

n Hooks—See Knives, Corn.

### Horse Nails—

See Nails, Horse.

### Horseshoes—

See Shoes, Horses.

### Hose, Rubber—

Garden Hose, 3/4-inch:

Competition.....ft. 5 @ 6¢

3-ply Standard.....ft. 8 @ 9¢

4-ply Standard.....ft. 10 @ 11¢

3-ply extra.....ft. 11 @ 13¢

4-ply extra.....ft. 14 @ 16¢

Cotton Garden, 3/4-in., coupled:

Low Grade.....ft. 8 @ 9¢

Fair Quality.....ft. 10 @ 11¢

### Irons— Sad—

From 4 to 10.....lb. 5 1/4 to 3¢

B. B. Sad Irons.....lb. 3 1/4 to 3 1/2¢

Chinese Laundry.....lb. 4 1/2 to 5¢

Chinese Sad.....lb. 4 @ 4 1/4¢

Mrs. Potts, cents per set:

Nos.....50 55 60 65

Jap'd Tops.....62 59 78 69

Tin'd Tops.....65 62 75 72

New England Pressing.....lb. 3 1/4 to 4¢

### Pinking—

Pinking Irons.....doz. 50 to 60¢

### Soldering—

Soldering Coppers, 3/4 & 3/2 @ 2 1/2¢

1 1/2 & 2.....22 to 23¢

### Jacks, Wagon—

Covert Mfg. Co.:  
Auto Screw.....30¢ to 2¢

Steel.....45%

Covert's Saddlery Works:  
Daisy.....60¢ to 10%

Victor.....60%

Lockport.....50%

Lane's Steel.....30¢ to 10¢

Richards' Tiger Steel, No. 130.....40%

### Kettles—

Brass, Spun, Plain.....20¢ to 25%

Enamelled and Cast Iron—See Ware,  
Hollow.

### Knives—

### Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%

Smith & Hemenway Co.....40¢ to 10%

Wilkinson Shear & Cutlery Co.....50%

### Corn—

Withington Acme, 7/8 doz. \$2.65;

Dent, \$2.75; Adj. Serrated, \$2.20;

Serrated, \$2.10; Yankee No. 1, \$1.50;

Yankee No. 2, \$1.15.

### Drawing—

Standard List.....75%

C. E. Jennings & Co., Nos. 45, 46, 60

Jennings & Griffin, Nos. 41, 42.....60%

Ohio Tool Co.'s.....70% to 10%

Swan's.....70% to 10%

Watrous.....16%

L. & I. J. White.....20¢ to 25%

### Hay and Straw—

Serrated Edge, per doz. \$5.25 to \$5.50

Iwan's Sickle Edge.....7/8 doz. \$9.50

Iwan's Serrated.....7/8 doz. \$10.00

### Mining—

Buffalo.....7/8 gro. \$13.00

### Miscellaneous—

Farmers'.....doz. \$3.00 to \$3.25

Wostenholm's.....7/8 doz. \$3.00 to \$3.25

### Knobs—

Base, 2 1/2-inch, Birch, or Maple,

Rubber tip.....gro. \$1.15 to \$1.20

Carriage, Jap., all sizes.....  
gro. 40¢ to 45¢

Door, Mineral.....doz. 65¢ to 70¢

Door, Por. Jap'd.....doz. 70¢ to 75¢

Door, Por. Nickel, doz. \$2.05 to \$2.15

Bardsley's Wood Door, Shutters, &c. 15%

Picture, Sargent's.....60¢ to 10¢ to 10%

### Lacing, Leather—

See Belting, Leather—

### Ladders, Store, &c.—

Lane's Store.....25%

Myers' Noiseless Store Ladders.....50%

Richards Mfg. Co.:  
Improved Noiseless, No. 112.....40%

Climax Shelf, No. 113.....50%

Trolley, No. 109.....40%

### Ladies, Melting—

L. & G. Mfg. Co. (low list).....25%

P. E. & W.....50%

Reading.....60%

Sargent's.....50% to 10%

### Lanterns—Tubular—

Regular Tubular, No. 0.....  
doz. \$4.25 to \$4.85

Lift Tubular, No. 0.....  
doz. \$4.50 to \$5.15

Hinge Tubular, No. 0.....  
doz. \$4.50 to \$5.15

Other Styles.....40¢ to 10¢ to 40¢ to 10%

### Bull's Eye Police—

No. 1, 2 1/4-inch.....\$2.50 to \$2.75

No. 2, 3-inch.....\$2.75 to \$3.00

### Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%

Stowell's Badger, Cast Iron.....50%

### Latches—Thumb—

Roggin's Latches, with screw.....  
doz. 35¢ to 40¢

### Door—

Richards' Bull Dog, Heavy, No. 125, 40%

Richards' Trump, No. 127.....50%

### Leaders, Cattle—

Small.....doz. 80¢; large, 60¢

Covert Mfg. Co., Cotton and Hemp.....45%

### Lifters, Transom—

R. & E.....33 1/2%

### Lines—

Wire Clothes, Nos. 18 19 20

100 feet.....\$2.20 2.00 1.65

75 feet.....\$1.80 1.70 1.30

Samson Cordage Works:

Solid Braided Chalk, Nos. 0 to 3, 40%

Silver Lake Braided Chalk, No. 0,

No. 1, \$6.50; No. 2, \$7.00; No. 3,

\$7.50.

Masons' Lines, Shade Cord, &c.:

White Cotton, No. 3 1/2, \$1.50; No. 4,

\$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2,

1 1/2; No. 4, \$2.25; No. 4 1/2, \$2.75;

Linen, No. 3 1/2, \$2.50; No. 4, \$3.50;

No. 4 1/2, \$4.50.

Tent and Awning Lines: No. 5,

White Cotton, \$7.50; Drab Cotton,

\$8.50.

Clothes Lines, White Cotton: 50 ft.,

\$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75

ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75;

100 ft. \$5.25.

Amnition Waterproof Clothes, 50 ft.,

\$2.00; \$2.40; Gilt Edge, \$2.20; Air

Line, \$2.00; Acme, \$1.00; Alabama,

\$1.50; Empire, \$1.00; Advance,

\$1.50; Orion, \$3.00; Albemarle,

\$1.50; Eclipse, \$1.50; Chicago,

**Tarred Paper—**

1 ply (roll 300 sq. ft.), ton.....	\$32.50@35.50
2 ply, roll 108 sq. ft.....	55@60
3 ply, roll 108 sq. ft.....	78@85
Slater's Felt (roll 500 sq. ft.).....	75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....	\$2.75

**Sand and Emery—**

Flint Paper and Cloth.....	60@10
Garnet Paper and Cloth.....	25¢
Emery Paper and Cloth.....	50@100

**Parers— Apple—**

Advance.....	doz. \$4.90
Baldwin.....	doz. \$4.50
Bonanza Improved.....	each \$6.50
Daisy.....	doz. \$4.00
Dandy.....	each \$7.50
Eureka Improved.....	each \$20.00
Family Bay State.....	doz. \$15.00
Improved Bay State.....	doz. \$15.00
Little Star.....	doz. \$5.00
New Lightning.....	doz. \$7.00
Reading 72.....	doz. \$3.25
Reading 78.....	doz. \$6.25
Rocking Table.....	doz. \$6.1
Turn Table.....	doz. \$6.00
White Mountain.....	doz. \$5.00

**Potato—**

Saratoga.....	doz. \$7.00
White Mountain.....	doz. \$6.00

**Picks and Mattocks—**

List Feb. 23, 1899.....	70¢5@75¢
Cronk's Handled Garden Mattock.....	doz. \$6.40

**Pinking Irons—**

See Irons, Pinking.

**Pins, Escutcheon—**

Brass.....	60@60@10
Iron, list Nov. 11, '85.....	60@60@10

**Pipe, Cast Iron Soil—**

Carload lots.	
Standard, 2-6 in.....	60%
Extra Heavy, 2-6 in.....	70%
Fittings.....	75%

**Pipe, Merchant—**

Carload Lots.	
Steel.	
Blk. Galv. Blk. Galv.	
1/2 & 1/4 in.....	67 1/2% 51 1/2% 65 1/2% 49 1/2%
3/4 & 1/2 in.....	71 1/2% 59 1/2% 69 1/2% 67 1/2%
5/8 & 3/4 in.....	75 1/2% 65 1/2% 74 1/2% 61 1/2%
7/8 & 1 in.....	70 1/2% 55 1/2% 69 1/2% 53 1/2%

**Pipe, Sewer—**

Carload lots.	
Standard Pipe and Fittings, 2 to 24 in.....	
New England.....	68%
New York and New Jersey.....	71%
Maryland, Delaware, E. Pa.....	75%
West. Pa. and West Va.....	71%
Virginia.....	76%
Ohio, Michigan and Ky.....	77%
Indiana.....	77%

**Pipe, Stove—**

Edwards' Nested Stove Pipe:	
5 in., per 100 joints.....	8.00
6 in., per 100 joints.....	7.50
7 in., per 100 joints.....	8.50

**Planes and Plane Irons—**

Wood Planes—	
Bench, first qual.....	40@10
Bench, Second qual.....	50@10
Molding.....	33 1/2@10
Bailey's (Stanley R. & L. Co.).....	40%
Chapin-Stephens Co.:.....	
Bench, First Quality.....	40@10@10
Bench, Second Quality.....	50@10@10
Molding.....	33 1/2@10
Toy and German.....	40@10@10
Chaplin's.....	60%
Ohio Tool Co.:.....	
Bench, First Quality.....	40@10@10
Bench, Second Quality.....	50@10@10
Molding.....	33 1/2@10
Adjustable Wood Bottom.....	60%
Union.....	60%

**Iron Planes—**

Bailey's (Stanley R. & L. Co.).....	40%
Chaplin's Iron Planes.....	50@10
Miscellaneous Planes (Stanley R. & L. Co.).....	35%
Ohio Tool Co.'s Iron Planes.....	60@10
Sargent's.....	60@10
Union.....	60%

**Plane Irons—**

Wood Bench Plane Irons.....	25¢10@30%
Buck Bros.....	30%
Chapin-Stephens Co.....	30@30@10
Ohio Tool Co.....	30%
Stanley R. & L. Co.....	35%
Union.....	50%
L. & I. J. White.....	20@5@25%

**Planters, Corn, Hand—**

Kohler's Eclipse.....	doz. \$8.50
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**Plates—**

Felco.....	lb. 3¢@14¢
Self-Sealing Pig Plates (S. S. & Co.).....	doz. \$2.00

**Pliers and Nippers—**

Button Pliers.....	75¢10@80%
Gas Burner, per doz. 5 in.....	\$1.25
Gas Pipe.....	7 8 10 12 in.
Acme Nippers.....	\$2.00 \$2.25 \$3.00 \$3.75
Cronk & Carrier Mfg. Co.:.....	
American Button.....	75¢10%
Cronk's.....	60@10
Improved Button.....	60@10
Stub's Pattern.....	50%
Combination and others.....	33%
Heller's Farriers' Nippers, Pincers and Tools.....	40@10@40@10@10%

P. S. & W. Timmers' Cutting Nippers.....	30@30@10%
Swedish Side, End and Diagonal Cutting Pliers.....	50%
Utica Drop Forge & Tool Co.:.....	
Pliers and Nippers, all kinds.....	40%

**Plumbs and Levels—**

Chapin-Stephens Co.:.....	
Plumbs and Levels.....	30@30@10@10%
Chapin's Imp. Brass Cor.....	40@40@10@10%
Pocket Levels.....	30@30@10@10%
Diston's Plumbs and Levels.....	70%
Diston's Pocket Levels.....	70%
C. E. Jennings & Co.'s Iron.....	33%
C. E. Jennings & Co.'s Iron, Adjustable.....	40@45%
Stanley R. & L. Co.....	45%
Stanley's Duplex.....	35%
Woods' Extension.....	33%

**Poachers, Egg—**

Buffalo Steam Egg Poachers, per doz., No. 1.....	\$6.00; No. 2.....\$9.00; No. 3.....\$12.00
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**Points, Glaziers—**

Bulk and 1-lb. papers, lb. 8 1/2¢@9 ¢	
1/2-lb. papers.....	lb. 9 ¢@9 1/2¢
1/4-lb. papers.....	lb. 9 1/2¢@10 1/4¢

**Pokes, Animal—**

Ft. Madison Hawkeye.....	doz. \$3.25
Ft. Madison Western.....	doz. \$4.00

**Police Goods—**

Manufacturers' Lists.....	25@25@5%
Tower's.....	25%

**Polish—Metal—**

Prestoline Liquid, No. 1 (1/2 pt.).....	doz. \$3.00; No. 2 (1 qt.).....\$7.72
Prestoline Paste.....	40@10
George William Hoffman.....	
U. S. Metal Polish Paste, 3 oz. boxes.....	doz. \$6.00; 1 lb. boxes.....\$2.25
U. S. Liquid, 8 oz. cans.....	doz. \$1.25; 1 lb. boxes.....\$2.00
Barkeepers' Friend Metal Polish.....	doz. \$1.75; 1 lb. cans.....\$1.80
Wynn's White Silk, 1/2 pt. cans.....	doz. \$2.00

**Stove—**

Black Eagle Benzine Paste, 5 lb. cans.....	doz. \$1.00
Black Eagle, Liquid, 1/2 pt. cans.....	doz. \$1.00
Black Jack Paste, 1/2 lb. cans.....	doz. \$1.00
Black Kid Paste, 5 lb. cans.....	each \$0.65
Ladd's Black Beauty, gr. \$10.00.....	50%
Joseph Dixon's, gr. \$5.75.....	10%
Dixon's Plumbago.....	doz. \$1.00
Firestone.....	doz. \$1.00
Gem.....	gr. \$1.50
Japanese.....	gr. \$3.50
Jet Black.....	gr. \$3.50
Peerless Iron Enamel, 10 oz. cans.....	doz. \$1.50

Wynn's:	
Black Silk, 5 lb. pail.....	each 70¢
Black Silk, 1/2 lb. box.....	doz. \$1.00
Black Silk, 5 oz. box.....	doz. \$0.75
Black Silk, 1/2 pt. liq.....	doz. \$1.00

**Poppers, Corn—**

1 qt., Square.....	gro. \$9.00
1 qt., Round.....	gro. \$10.00
1 1/2 qt., Square.....	gro. \$11.00
2 qt., Square.....	gro. \$13.00

**Post Hole and Tree Augers and Diggers—**

See also Diggers, Post Hole, &amp;c.

**Posts, Steel—**

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 45¢; 6 1/2 ft., 48¢	
Steel Hitching Posts.....	each \$1.30

**Potato Parers—**

See Parers, Potato.

**Pots, Glue—**

Enamelled.....	40%
Tinned.....	35%

**Powder—**

In Canisters:	
Duck, 1 lb.....	each 45¢
Fine Sporting, 1 lb.....	each 75¢
Rifle, 1/2 lb.....	each 15¢
Rifle, 1 lb.....	each 25¢
In Kegs:	
12 1/2-lb. kegs.....	\$2.50
25-lb. kegs.....	\$4.50
King's Semi-Smokeless:	
Keq (25 lb. bulk).....	\$6.50
Half Keg (12 1/2 lb. bulk).....	\$3.50
Quarter Keg (6 1/4 lb. bulk).....	\$1.90
Case 21 (1 lb. cans bulk).....	\$3.50
Half case (1 lb. cans bulk).....	\$4.50
King's Smokeless: Shot Gun Rifle, Keq (25 lb. bulk).....	\$12.00
Half Keg (12 1/2 lb. bulk).....	\$7.75
Quarter Keg (6 1/4 lb. bulk).....	3.25
Case 21 (1 lb. cans bulk).....	14.00
Half case 12 (1 lb. c. bk.).....	7.25
Robin Hood Sm'less Shot Gun.....	50@20%

**Presses—**

Fruit and Jelly.....	20@25%
Enterprise Mfg. Co.....	20@25%

**Seal Presses—**

Morrill's No. 1, per doz.....	\$30.00
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**Pruning Hooks and Shears**

See Shears.

**Pullers, Cork—**

Invinible Cork Puller.....	\$21.00
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**Pullers, Nail—**

Cyclops.....	50%
Miller's Falls, No. 3, per doz.....	\$12.00
Morrill's No. 1, Nail Puller.....	33 1/2@10%
Pearson No. 1, Cyclops Spike Puller, each \$30.00.....	50%
Pelican.....	doz. \$9.00
Scranton, Case Lots:	
No. 2B (large).....	\$5.50
No. 3B (small).....	\$5.00
Smith & Hemenway Co.:.....	
Diamond B. No. 2, case lots.....	doz. \$6.00
Diamond B. No. 3, case lots.....	doz. \$5.50
Giant No. 1, per doz.....	\$18.00
Giant No. 3, \$15.....	40%

**Pulleys, Single Wheel—**

Inch.....	1 1/2 1 3/4 2 3
Acning or Tackle.....	doz. \$0.30 .45 .60 1.05
Hay Fork Swivel or Solid Eye.....	doz., 4 in., \$1.25; 5 in., \$1.55
Inch.....	2 2 1/4 2 1/2
Hot House.....	doz., \$0.65 .85 1.20
Inch.....	1 1/4 1 1/2 1 3/4
Screw, doz.....	\$0.16 .19 .23 .30
Inch.....	1 1/4 2 2 1/4 2 1/2
Side, doz.....	\$0.25 .40 .55 .60
Inch.....	1 1/4 1 3/4 2 2 1/2
Stowell's:	
Ceiling or End, Anti-Friction.....	60@10%
Dumb Waiter, Anti-friction.....	60@10%
Electric Light.....	60%
Side, Anti-Friction.....	60@10%

**Sash Pulley—**

Common Frame; Square or Round End, per doz, 1 1/2 and 2 in.....	16@19¢
Auger Mortise, no Face Plate, per doz., 1 1/2 and 2 in.....	16@19¢
Acme.....	1 1/2 in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 1, 2 in.....	doz. 50%
Grand Rapids All Steel Noiseless.....	70@10%
Ideal.....	1 1/2 in., 16¢; 2 in., 19¢
Niagara.....	1 1/2 in., 14¢; 2 in., 16¢
No. 26, Troy.....	1 1/2 in., 16¢; 2 in., 19¢
Star.....	1 1/2 in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.	

**Pumps—**

Cistern.....	60@60@10%
Pitcher Spout.....	80@80@10%
Wood Pumps, Tubing, &c.....	45@50%
Barnes Dbl. Acting (low list).....	50%
Barnes' Pitcher Spout.....	75@10@5%
Contractors' Rubber Diaphragm No. 2 B. & L. Co.....	\$16.00
Daisy Spray Pump.....	doz. \$7.20
Flint & Walling's, Fast Mail Hand, (low list).....	55%
Flint & Walling's Fast Mail (low list).....	55@5%
Flint & Walling's Tight Top Pitcher.....	80%
National Specialty Mfg. Co., Measuring.....	40.00
Mechanical Sprayer.....	\$7.20
Myers' Pumps (low list).....	50%
Myers' Power Pumps.....	50%
Myers' Spray Pumps.....	50%

**Pump Leathers—**

Plunger and Lower Valve—Per gro.:.....	
Inch.....	2 2 1/4 2 1/2 3 3/4
.....	\$2.20 2.50 2.75 3.00
Inch.....	3 3 1/4 3 1/2 4 4 1/4
.....	\$3.30 3.60 3.85 4.10
Plunger Cup Leathers—Per 100:	
Inch.....	2 1/2 3 3 1/2 4
.....	\$2.75 3.85 5.00 6.00

**Punches—**

Saddlers' or Drive, good.....	doz. 50@75¢
Spring, single tube, good quality.....	doz. \$1.75@2.00
Revolving (4 tubes).....	doz. \$3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.....	50%
Bemis & Call Co.'s Check.....	55%
Morrill's No. 1 (A. B. C.).....	doz. \$15.50
No. 2, per doz.....	\$22.50
Hercules, each.....	\$7.50
Niagara Hollow Punches.....	40%
Niagara Solid Punches.....	55@10%
Steel Screw, B. & K. Mfg. Co.....	50%
Timmers' Hollow, P. S. & W. Co.....	55@55%
Timmers' Solid, P. S. & W. Co.....	doz., \$1.44

**Rail—Barn Door, &c.—**

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:	
1/2 3/4 1 in.	\$2.50 \$3.00 \$4.40
Angular for Sq. Groove Wheels:	
Small, Med. Large.	\$2.00 \$2.70 \$3.60
Sliding Door, Painted Iron.....	2 1/2@2 3/4¢

**Sliding Door, Wrought Brass,**

1/2 in. lb., 36¢.....	30%
Althill Mfg. Co.:	
No. 1, Reliable Hgr. Track, @ ft. 5 1/2¢	
No. 2, Reliable Hgr. Track, @ ft. 7¢	
Cronk's:	
Double Braced Steel Rail.....@ ft. 3¢	
O. N. T. Rail.....	2¢
Griffin's:	
xxx, @ 100 ft., 1 x 3-16 in., \$3.00;	
1 1/4 x 3-16 in., 3.50.	
Hinged Hanger, @ 100 ft., 1 x 3-16	
in., \$3.10; 1 1/4 x 3-16 in., \$3.60.	
Lane's:	
Hinged Track, @ 100 ft., 1 in., \$3.70;	
1 1/4 in., \$4.40.	
O. N. T., @ 100 ft., 1 in., \$2.75; 1 1/4	



**Sisal, Tarred, Medium Lath**  
**Yarn:**  
 Mixed ..... lb. 7½¢  
 Pure ..... lb. 9¢  
**Cotton Rope:**  
 Best, ¼-in. and larger ..... lb. 16¢  
 Medium, ¼-in. and larger ..... lb. 14¢  
 Common, ¼-in. and larger ..... lb. 10½¢  
**Jute Rope:**  
 Thread No. 1, ¼-in. & up. lb. 6½¢  
 Thread No. 2, ¼-in. & up. lb. 5½¢  
 Old Colony Manila Transmission  
 Rope ..... lb. 17½¢  
**Wire Rope**  
 Galvanized ..... 12½¢  
 Plain ..... 50¢  
**Ropes, Hammocks—**  
 Covert Mfg. Co.:  
 Jute ..... 50¢  
 Sisal ..... 30¢  
 Covert Saddlery Works ..... 60¢  
**Rules—**  
 Boxwood ..... 60¢  
 Ivory ..... 35¢  
 Chapin-Stephens Co.:  
 Boxwood ..... 60¢  
 Flexiford ..... 27½¢  
 Ivory ..... 35¢  
 Miscellaneous ..... 50¢  
 Combination ..... 55¢  
 Stationers' ..... 10¢  
 Keuffel & Esser Co.:  
 Folding, Wood ..... 35¢  
 Folding, Steel ..... 35¢  
 Lufkin's Steel ..... 50¢  
 Lufkin's Lumber ..... 60¢  
 Stanley R. & L. Co.:  
 Boxwood ..... 62½¢  
 Ivory ..... 45¢  
 Miscellaneous ..... 60¢  
 Zig Zag ..... 12½¢  
 Zig Zag, Pin Joint ..... 12½¢  
 Upon Nut Co.:  
 Boxwood ..... 60¢  
 Ivory ..... 35¢  
**Sash Balances—**  
 See Balance, Sash.  
**Sash Locks—**  
 See Locks, Sash.  
**Sash Weights—**  
 See Weights, Sash.  
**Sausage Stuffers or Fillers**  
 See Stuffers or Fillers, Sausage.  
**Saw Frames—**  
 See Frames, Saw.  
**Saw Sets—**  
 See Sets, Saw.  
**Saw Tools—**  
 See Tools, Saw.  
**Saws—**  
 Atkins':  
 Circular ..... 50¢  
 Band ..... 35¢  
 Cross Cut ..... 35¢  
 Mulay, Mill and Drag ..... 50¢  
 One-Man Saw ..... 40¢  
 Wood Saws ..... 40¢  
 Hand, Compass, &c. .... 40¢  
 Chapin-Stephens Co.:  
 Turning Saws and Frames ..... 30¢  
 Diamond Saw & Stamping Works ..... 30¢  
 Sterling Kitchen Saws ..... 30¢  
 Disston's:  
 Circular, Solid and Ins'ted Tooth ..... 60¢  
 Band, 2 to 14 in. wide ..... 60¢  
 Band, ¼ to 1½ ..... 50¢  
 Crosscuts ..... 50¢  
 Narrow Crosscuts ..... 50¢  
 Mulay, Mill and Drag ..... 50¢  
 Framed Woodsaws ..... 35¢  
 Woodsaw Blades ..... 25¢  
 Hand Saws, Nos. 12, 99, 9, 16, 1100,  
 D2, 120, 76, 77, 8 ..... 25¢  
 Flat Head, Nos. 7, 107, 107½, 3, 1,  
 0, 00, Combination ..... 30¢  
 Compass, Key Hole, &c. .... 25¢  
 Butcher Saws and Blades ..... 30¢  
 C. E. Jennings & Co.'s:  
 Back Saws ..... 25¢  
 Butcher Saws ..... 30¢  
 Compass and Key Hole Saws ..... 35¢  
 Framed Wood Saws ..... 30¢  
 Hand Saws ..... 20¢  
 Wood Saw Blades ..... 35¢  
 Millers Falls:  
 Butcher Saws ..... 15¢  
 Star Saw Blades ..... 15¢  
 Peace & Richardson's Hand Saws ..... 30¢  
 Simonds':  
 Circular Saws ..... 50¢  
 Crescent Ground Cross Cut Saws ..... 35¢  
 One-Man Cross Cuts ..... 40¢  
 Gang Mill, Mulay and Drag Saws ..... 40¢  
 Band Saws ..... 50¢  
 Back Saws ..... 25¢  
 Butcher Saws ..... 30¢  
 Hand Saws ..... 25¢  
 Hand Saws, Bay State Brand ..... 45¢  
 Compass, Key Hole, &c. .... 25¢  
 Wood Saws ..... 35¢  
 Springfield Mach. Screw Co.:  
 Diamond Kitchen Saws ..... 40¢  
 Butcher Saw Blades ..... 35¢  
 Wheeler, Madden & Clemons Mfg.  
 Co.'s Cross Cut Saws ..... 50¢  
**Hack Saws—**  
 Atkins' Hack Saw Blades A & A ..... 25¢  
 Disston's:  
 Concave Blades ..... 25¢  
 Keystone ..... 25¢  
 Hack Saw Frames ..... 30¢  
 Fitchburg File Works, The Best ..... 25¢  
 C. E. Jennings & Co.'s:  
 Hack Saw Frames, Nos. 175, 180 ..... 40¢  
 Hack Saws, Nos. 175, 180, complete ..... 40¢  
 Goodell's Hack Saw Blades ..... 40¢  
 Griffin's Hack Saw Frames ..... 35¢  
 Griffin's Hack Saw Blades ..... 35¢  
 Springfield Mach. Screw Co.:  
 Diamond Hack Saw Blades ..... 35¢  
 Diamond Hack Saw Frames ..... 50¢  
 Star Hack Saws and Blades ..... 15¢  
 Sterling Hack Saw Blades ..... 30¢  
 Sterling Hack Saw Frames ..... 30¢  
**Scroll—**  
 Barnes' No. 7, 115 ..... 35¢  
 Barnes' Scroll Saw Blades ..... 40¢  
 Barnes' Velpede Power Scroll Saw,  
 without boring attachment, \$18 ..... 18¢  
 with boring attachment, \$20 ..... 20¢

Lester, complete, \$10.00 ..... 15¢  
 Rogers, complete, \$1.00 ..... 15¢  
**Scalers, Fish—**  
 Covert's Saddlery Works ..... 60¢  
**Scales—**  
 Family, Turnbull's ..... 50¢  
 Counter:  
 Hatch, Platform, ½ oz. to 4  
 lbs. ..... doz. \$5.50  
 Tico Platforms, ½ oz. to 8  
 lbs. ..... doz. \$16.00  
 Union Platform, Plain, \$1.70 ..... 1.90  
 Union Platform, Stpd. \$1.85 ..... 2.15  
 Chatillon's:  
 Eureka ..... 25¢  
 Favorite ..... 40¢  
 Crocker's Trip Scales ..... 50¢  
 Chicago Scale Co.:  
 The "Little Detective" ..... 25¢  
 Union or Family No. 2 ..... 50¢  
 Portable Platform (reduced list) ..... 50¢  
 Wagon or Stock (reduced list) ..... 50¢  
 The Standard "Portables" ..... 50¢  
 "The Standard" R. R. and Wagon ..... 50¢  
**Scrapers—**  
 Box, 1 Handle ..... doz. \$2.00  
 Box, 2 Handle ..... doz. \$2.60  
 Ship ..... Light, \$2.00; Heavy, \$1.50  
 Adjustable Box Scraper (S. R. & L.  
 Co.) ..... \$6.00  
 Chapin-Stephens Co., Box ..... 50¢  
**Screens, Window and  
 Frames—**  
 Air Line Pattern Screens ..... 60¢  
 Flyer Pattern Screens ..... 60¢  
 Maine Screen Frames ..... 40¢  
 Hand, Wood ..... 30¢  
 Perfection Screens ..... 60¢  
 Phillips' Screen Frames ..... 60¢  
 See also Doors.  
**Screws—Bench and Hand**  
 Bench, Iron, doz., 1 in., \$2.50 ..... 2.75  
 2 ½, 1 ½, \$3.00 ..... 3.25  
 1 ½, \$3.50 ..... 3.75  
 Bench, W'd., Beech, doz. 30¢ ..... 30¢  
 Hand, Wood ..... 30¢  
 R. Bliss Mfg. Co., Hand ..... 30¢  
 Chapin-Stephens Co., Hand ..... 30¢  
 Ohio Tool Co., Bench and Hand ..... 30¢  
**Coach, Lag and Hand Rail—**  
 Lag, Cone Point, list Oct. 1,  
 '99 ..... 75¢  
 Coach, Gimlet Point, list  
 Oct. 1, '99 ..... 75¢  
 Hand Rail, list Jan. 1, '81 ..... 70¢  
**Jack Screws—**  
 Standard List ..... 75¢  
 Millers Falls ..... 50¢  
 Millers Falls, Roller ..... 50¢  
 P. S. & W ..... 70¢  
 Sargent ..... 70¢  
 Sweet Iron Works ..... 75¢  
**Machine—**  
 List Jan. 1, '98:  
 Flat or Round Head, Iron ..... 50¢  
 Flat or Round Head, Brass ..... 50¢  
**Set and Cap—**  
 Set (Iron) ..... 80¢  
 Set (Steel), net advance over  
 Iron ..... 25¢  
 Sq. Hd. Cap ..... 75¢  
 Hex. Hd. Cap ..... 75¢  
 Rd. Hd. Cap ..... 60¢  
 Fittler Hd. Cap ..... 60¢  
**Wood—**  
 List July 23, 1903.  
 Manufacturers' printed discounts:  
 Flat Head, Iron ..... 57½¢  
 Round Head, Iron ..... 55¢  
 Flat Head, Brass ..... 55¢  
 Round Head, Brass ..... 55¢  
 Flat Head, Bronze ..... 77½¢  
 Round Head, Bronze ..... 77½¢  
 Drive Screws ..... 87½¢  
**Scroll Saws—**  
 See Saws, Scroll.  
**Scythes—**  
 Prices announced for next season:  
 Clipper Pattern, Grass ..... \$6.20  
 Full Polished, Clipper ..... \$6.75  
 Grain ..... \$8.00  
 Clipper, Grain ..... \$8.25  
 Weed and Bush ..... \$6.25  
**Seeders, Raisin—**  
 Enterprise ..... 25¢  
**Sets—Awl and Tool—**  
 Aiken's Sets, Awl and Tools:  
 No. 20, ½ doz. \$10.00 ..... 50¢  
 Fray's Adj. Tool Handles, Nos. 1, 112;  
 2, 118; 3, 112; 4, 80; 5, 7 ..... 50¢  
 C. E. Jennings & Co.'s Model Tool  
 Holders ..... 30¢  
 Millers Falls Adj. Tool Handles, No.  
 1, 112; No. 4, 112; No. 5, 118 ..... 15¢  
**Garden Tool Sets—**  
 Ft. Madison Three Plows, Hoe, Rake  
 and Shovel ..... doz. sets \$9.00  
 Octagon ..... doz. \$5.00  
 Buck Bros. ..... 25¢  
 Cannon's Diamond Point, ½ doz. ..... 12¢  
 Mayhew's ..... 30¢  
 Snell's Cannon's Diamond Point ..... 30¢  
 Snell's Cor'gated, Cup Pt. ..... 30¢  
 Snell's Knurled, Cup Pt. ..... 30¢  
 Springfield Mach. Screw Co.:  
 Diamond Knurled Cup Pt. ..... 30¢  
**Rivet—**  
 Regular list ..... 75¢  
**Saw—**  
 Aiken's:  
 Genuine ..... 50¢  
 Imitation ..... 50¢  
 Atkins':  
 Criterion ..... 40¢  
 Adjustable ..... 60¢  
 Bemis & Call Co.'s:  
 Cross Cut ..... 30¢

Plate ..... 20¢  
 Disston's Star and Monarch ..... 25¢  
 Morrill's No. 1, \$15.00 ..... 50¢  
 Nos. 3 and 4, Cross Cut, \$20.63 ..... 50¢  
 No. 5, Mill, \$30.00 ..... 50¢  
 Nos. 10, 11, 35, \$15.63 ..... 50¢  
 No. 1, Oil Style, \$10.00 ..... 50¢  
 Special, \$16.25 ..... 50¢  
 Giant Royal, Cross Cut ..... 50¢  
 Royal, Hand ..... 50¢  
 Taintor Positive ..... 50¢  
**Shaving—**  
 Fox Shaving Sets, No. 30 ..... 20¢  
**Sharpeners, Knife—**  
 Chicago Wheel & Mfg. Co. .... 65¢  
**Shaves, Spoke—**  
 Iron ..... doz. \$1.10  
 Wood ..... doz. \$1.75  
 Bailey's (Stanley R. & L. Co.) ..... 45¢  
 Razor Edge (Stanley R. & L. Co.) ..... 35¢  
 Chapin-Stephens Co. ..... 30¢  
 Goodell's ..... 15¢  
 Wood's Fl and F2 ..... 50¢  
**Shears—**  
 Cast Iron ..... 7 8 9 in.  
 Best ..... \$16.00 18.00 20.00 gro.  
 Good ..... \$13.00 15.00 17.00 gro.  
 Cheap ..... \$5.00 6.00 7.00 gro.  
 Straight Trimmers, &c.:  
 Best quality Jap. .... 70¢  
 Best quality, Nickel ..... 60¢  
 Fair quality, Jap. .... 60¢  
 Fair quality, Nickel ..... 75¢  
 Tailors' Shears ..... 40¢  
 Acme Cast Shears ..... 40¢  
 Heinisch's Tailor's Shears ..... 10¢  
 Wilkinson's Hedge, 1900 list ..... 45¢  
 Wilkinson's Branch, Lawn & Border ..... 40¢  
 Wilkinson's Sheep, 1900 list ..... 50¢  
**Tinners' Snips—**  
 Steel Blades ..... 20¢  
 Steel Laid Blades ..... 40¢  
 Forged Handles, Steel Blades, Berlin,  
 40¢  
 Heinisch's Snips ..... 40¢  
 Jennings & Griffin Mfg. Co.'s 6½ to  
 9 in. ..... 50¢  
 P. S. & W. Co. .... 20¢  
**Pruning Shears and Tools**  
 Cronk's Grape Shears ..... 33½¢  
 Cronk's Pruning Shears ..... 33½¢  
 Disston's Pruning Hook, ½ doz. ..... 25¢  
 Disston's Pruning Hook, 1 doz. ..... 25¢  
 John T. Henry Mfg. Co.:  
 Pruning Shears, all grades ..... 40¢  
 Orange Shears ..... 50¢  
 Grape ..... 40¢  
 Tree Pruners ..... 75¢  
 P. S. & W. Co. .... 33½¢  
**Sheaves—Sliding Door—**  
 Stowell's Anti-Friction ..... 50¢  
 Patent Roller, Hatfield's, Sargent's ..... 70¢  
 Reading list ..... 33½¢  
 R. & E. list ..... 33½¢  
 Wrightville Hatfield Pattern ..... 80¢  
**Sliding Shutter—**  
 Reading list ..... 40¢  
 R. & E. list ..... 33½¢  
 Sargent's list ..... 50¢  
**Shells—Shells, Empty—**  
 Brass Shells, Empty:  
 First quality all gauges ..... 60¢  
 Climax, Club, Rival, 10 and 12  
 gauge ..... 65¢  
 Paper Shells, Empty:  
 Acme, Ideal, Leader, New Rapid,  
 Magic, 10, 12, 16 and 20 gauge ..... 25¢  
 Blue Rival, New Climax, Challenge,  
 Monarch, Defiance, Repeater, Yel-  
 low Rival, 10, 12, 16 and 20 gauge ..... 20¢  
 Climax, Union, League, New Rival,  
 10 and 12 gauge ..... 20¢  
 Climax, Union, League, New Rival,  
 14, 16 and 20 gauge (\$7.50 list) ..... 20¢  
 Expert, Metal Lined and Pigeon, 10,  
 12, 16 and 20 gauge ..... 33½¢  
 Robin Hood, Low Brass ..... 20¢  
 Robin Hood, High Brass ..... 30¢  
**Shells, Loaded—**  
 Loaded with Black Powder ..... 40¢  
 Loaded with Smokeless Powder,  
 medium grade ..... 40¢  
 Loaded with Smokeless Powder,  
 high grade ..... 40¢  
 Robin Hood Smokeless Powder:  
 Robin Hood, Low Brass ..... 50¢  
 Comets, High Brass ..... 50¢  
**Shoes, Horse, Mule, &c.—**  
 F.o.b. Pittsburgh:  
 Iron ..... per keg \$1.00  
 Steel ..... per keg \$3.75  
 Burden's, all sizes ..... per keg \$3.90  
**Shot—**  
 Drop, up to B, 25-lb. bag ..... \$1.65  
 Drop, B and larger ..... per 25-lb. bag, \$1.90  
 Buck, 25-lb. bag ..... \$1.90  
 Chilled, 25-lb. bag ..... \$1.90  
**Shovels and Spades—**  
 Association List, Nov. 15, 1902 ..... 40¢  
**Sieves and Sifters—**  
 Hunter's Imitation ..... gro. \$10.50  
 Hunter's Genuine ..... per gro. \$12.00  
 Buffalo Metallic Blue, S. S. Co., ½ gr.:  
 14&16 ..... 14&18 ..... 18&20 ..... 14&20  
 \$13.20 ..... \$13.50 ..... \$14.40 ..... \$14.40  
 Shaker (Barley's Pat.) Flour Sifters ..... 20¢  
**Sieves, Seamless Metallic—**  
 Per dozen:  
 Mesh ..... 14 16 18 20  
 Iron Wire ..... \$1.05 1.05 1.10 1.20  
 Tinned Wire ..... \$1.15 1.15 1.20 1.30

**Sieves, Wooden Rim—**  
 Nested, 10, 11 and 12 inch.  
 Mesh 18, Nested ..... doz. \$0.90  
 Mesh 20, Nested ..... doz. \$1.00  
 Mesh 24, Nested ..... doz. \$1.30  
**Sinks, Cast Iron—**  
 Standard list ..... 60¢  
 NOTE—There is not entire uniformity  
 in lists used by jobbers.  
**Skeins, Wagon—**  
 Cast Iron ..... 80¢  
 Steel ..... 40¢  
**Slates, School—**  
 Factory Shipments.  
 "D" Slates ..... 50¢  
 Eureka, Unexcelled Noiseless ..... 60¢  
 Victor A, Noiseless ..... 60¢  
**Slaw Cutters—See Cutters.**  
**Snaps, Harness—**  
 German ..... 40¢  
 Covert Mfg. Co.:  
 Derby ..... 30¢  
 High Grade ..... 35¢  
 Jockey ..... 35¢  
 Trojan ..... 30¢  
 Yankee ..... 30¢  
 Yankee Roller ..... 30¢  
 Covert's Saddlery Works:  
 Crown ..... 60¢  
 German ..... 60¢  
 Model ..... 60¢  
 Triumph ..... 60¢  
 Oneida Community ..... 60¢  
 Solid Swivel ..... 60¢  
 Sargent's Patent Guarded ..... 60¢  
**Snaths—**  
 Scythe ..... 50¢  
**Snips, Tinner's—See Shears.**  
**Spoons and Forks—**  
 Silver Plated—  
 Good Quality ..... 50¢  
 Cheap ..... 60¢  
 International Silver Co.:  
 1817 Rogers Bros. and Rogers &  
 Hamilton ..... 40¢  
 Rogers & Bro., William Rogers ..... 50¢  
 Eagle Brand ..... 50¢  
 Anchor Rogers Brand ..... 60¢  
 Wm. Rogers & Son ..... 60¢  
**Miscellaneous—**  
 German Silver ..... 60¢  
 Cattaraugus Cutlery Co.:  
 Seneca Silver ..... 50¢  
**Tinned Iron—**  
 Teas ..... per gro. \$5.50  
 Tables ..... per gro. \$0.90  
**Springs—Door—**  
 Chicago (Coil) ..... 40¢  
 Gem (Coil) ..... 20¢  
 Pullman (Coil) ..... 25¢  
 Reliance (Coil) ..... 40¢  
 Star (Coil) ..... 40¢  
 Turrey's Rod, 39 in. .... doz. \$1.10  
 Victor (Coil) ..... 50¢  
**Carriage, Wagon, &c.—**  
 14 in. and wider: Per lb.  
 Black ..... 44¢  
 Half Bright ..... 44¢  
 Bright ..... 44¢  
 Painted Steel Springs:  
 14 x 2 x 26 ..... per pr. 42¢  
 14 x 3 x 28 ..... per pr. 70¢  
**Sprinklers, Lawn—**  
 Enterprise ..... 25¢  
 Philadelphia No. 1, ½ doz. \$12.00 ..... 30¢  
 S. 15; No. 3, \$24 ..... 30¢  
**Squares—**  
 Nickel plated ..... List Jan. 5, 1900.  
 Steel and Iron ..... 75¢  
 Rosewood Hdl. Try Square and  
 T-Beevil ..... 60¢  
 Iron Hdl. Try Squares and T-  
 Beevil ..... 40¢  
 Disston's Try Sq. and T-Beevil ..... 70¢  
 Winterbottom's Try and Miter, No.  
 1, 40; No. 2 ..... 50¢  
**Squeezers, Lemon**  
 Wood, Common, gro., No. 0,  
 \$5.25 ..... \$5.50  
 Wood, Porcelain Lined:  
 Cheap ..... doz. \$1.00  
 Good Grade ..... doz. \$1.25  
 Tinned Iron ..... doz. \$0.75  
 Iron, Porcelain Lined ..... doz. \$1.75  
**Staples—**  
 Barbed Blind ..... lb. 60¢  
 Electricians' Association list ..... 80¢  
 Fence Staples, Plain, \$2.25; Gal-  
 vanized ..... \$2.55  
 Poultry Netting Staples ..... per lb. 3¼¢  
 Grand Crossing Tack Co.'s list ..... 80¢  
**Steels, Butchers—**  
 Dick's ..... 30¢  
 Foster Bros. ..... 30¢  
 C. & A. Hoffmann's ..... 40¢  
**Steelyards—**  
 30¢  
**Stocks and Dies—**  
 Blacksmiths' ..... 50¢  
 Curtis Rev'ble Ratchet Die Stock ..... 25¢  
 Derby Screw Plates ..... 25¢  
 Gardner Die Stocks No. 1 ..... 40¢  
 Gardner Die Stocks, larger sizes ..... 40¢  
 Green River ..... 25¢  
 Lightning Screw Plate ..... 25¢  
 Little Giant ..... 25¢  
 Reece's New Screw Plates ..... 25¢  
**Stone—Scythe Stones—**  
 Chicago Wheel & Mfg. Co.:  
 Gem Corundum, 10 in. ..... \$8.00  
 gro., 12 in. ..... \$10.80  
 Norton Emery Scythe Stones:  
 Less than gross lots ..... per gro. \$9.00  
 One gross or more ..... per gro. \$7.20  
 Lots of 10 gross or more ..... per gro. \$6.00

## Pike Mfg. Co., 1901 list:

Black Diamond S. S.	gro. \$12.00
Lamotte S. S.	gro. \$11.00
White Mountain S. S.	gro. \$9.00
Green Mountain S. S.	gro. \$6.00
Extra Indian Pond S. S.	gro. \$7.50
No. 1 Indian Pond S. S.	gro. \$7.00
No. 2 Indian Pond S. S.	gro. \$4.50
Leader Red End S. S.	gro. \$4.50
Emery and Corundum	10 in. gro. \$9.00
Pure Corundum	10 in. gro. \$12.00
Emery Scythe Rifles	2 Coats, \$7.00
Emery Scythe Rifles	3 Coats, \$8.00
Emery Scythe Rifles	4 Coats, \$12.00
Balance of 1904 list	33 1/2%

## Oil Stones, &amp;c.—

Chicago Wheel & Mfg. Co., 1901 list:	
Gem Corundum Oil, Double Grit	50%
Gem Corundum Oil, Single or Double Grit	50%
Gem Corundum Slips	50%
Gem Corundum Razor Hones	50%
Pike Mfg. Co., 1901 list:	
Arkansas St. No. 1, 3 to 6 in.	\$2.80
Arkansas St. No. 1, 8 to 10 in.	\$3.50
Arkansas Slips No. 1	\$4.00
Lily White Washita, 4 to 8 in.	\$6.00
Road Red Washita, 4 to 8 in.	\$6.00
Washita St., Extra, 4 to 8 in.	\$6.00
Washita St., No. 1, 4 to 8 in.	\$6.00
Washita St., No. 2, 4 to 8 in.	\$6.00
Lily White Slips	90¢
Road Red Slips	90¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Washita Slips, No. 2	40¢
India Oil Stones (entire list)	35%
Quickcut Emery and Corundum Oil	35%
Stone, Double Grit	35%
Quickcut Emery and Corundum Oil	35%
Stone, Double Grit	35%
Quickcut Emery Rubbing Bricks	35%
Hindostan No. 1, R'g'lar, 9 to 8 in.	\$1.00
Hindostan No. 1, Small, 9 to 8 in.	\$1.00
Axe Stones (all kinds)	80¢
Turkey Oil Stones, Extra, 5 to 8 in.	\$1.00
Queer Creek Stones, 4 to 8 in.	20¢
Queer Creek Slips	40¢
Sand Stone	6¢
Belgian, German and Swaty Razor Hones	50%
Natural Grit Carving Knife	50%
Hones	50%
Quick Edge Pocket Knife	50%
Hones	50%
Mounted Kitchen Sand Stone	50%

## Stoners, Cherry—

Enterprise	25 to 30%
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## Stoppers, Bottle—

Victor Bottle Stoppers	gro. \$9.00
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## Stops—Bench—

Millers Falls	15 to 10%
Morrill's, No. 1	\$10.00
Morrill's, No. 2	\$12.50

## Door—

Chapin-Stephens Co.	60 to 60 1/2%
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## Plane—

Chapin-Stephens Co.	20%
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## Straps—Box—

Cary's Universal, case lots	20 to 10 1/2%
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## Hame—

Covert's Saddlery Works	60 to 10%
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## Stretchers, Carpet—

Cast Iron, St'l Points, doz.	55 to 60%
Socket	doz. \$1.75
Excelsior Stretcher and Tack Hammer Combined	doz. \$6.00

## Stuffers, Sausage—

Enterprise Mfg. Co.	25 to 25 1/4%
National Specialty Co., list Jan. 1, 1902	30 to 35%

## Sweepers, Carpet—

National Sweeper Co.	doz. \$2.00
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Auditorium, Roller Bearing (20 in. case), Nickel	\$54.00
Mammoth, Roller Bearing (30 in. case), Nickel	\$60.00
Marion, Roller Bearing, regular finishes, full Nickel	\$21.00
Marion Queen, Roller Bearing, full Nickel	\$24.00
Monarch, Roller Bearing, N'kel, \$22.00	
Monarch, Roller B'g, Jap'ned, \$20.00	
Transparent, Roller Bearing, Plate Glass Top, Nickel	\$36.00
Monarch Extra, Roller Bearing, (17-in. case), Nickel	\$36.00
Monarch Extra, Roller Bearing, (17-in. case), Japanned	\$33.00
National Queen, Fancy Veneers, \$27.00	
Perpetual, Regular B'g's, Nkl, \$20.00	
Perpetual, Regular B'g's, Jap, \$18.00	
Triple Medal	\$24.00

NOTE.—Rebates 30¢ per dozen on three-dozen lots; \$1 per dozen on five-dozen lots; \$2 per dozen on ten-dozen lots; \$2.50 per dozen on twenty-five-dozen lots.

## Tacks, Finishing Nails, &amp;c.

New List, May 1, 1905.

American Carpet Tacks	90 to 57 1/2%
American Cut Tacks	90 to 57 1/2%
Suedes Cut Tacks	90 to 57 1/2%
Suedes Upholsterers' Tacks	90 to 57 1/2%
Gimp Tacks	90 to 50%
Lace Tacks	90 to 50%
Trimmers' Tacks	90 to 57 1/2%
Looking Glass Tacks	65%
Bill Posters' and Railroad Tacks	90 to 50%
Hungarian Nails	90 to 57 1/2%
Finishing Nails	70%
Trunk and Clout Nails	80 to 45%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights and an extra 10% is given on light weights.

## Miscellaneous—

Double Pointed Tacks	90 to 46 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.	50 to 10 to 60%
See also Nails, Wire.	

## Tanks, Oil—

Emerald, S. S. & Co.	30-gal. \$3.40
Emerald, S. S. & Co.	60-gal. \$4.25
Queen City, S. S. & Co.	30-gal. \$3.65
Queen City, S. S. & Co.	60-gal. \$4.50

## Tapes, Measuring—

American Asses' Skin	40 to 10 to 50%
Patent Leather	25 to 30 to 45%
Steel	10 to 10 to 10%
Chesterman's	25 to 25 to 45%
Eddy Asses' Skin	40 to 10 to 45%
Eddy Patent Leather	25 to 30 to 45%
Eddy Steel	40 to 40 to 10%
Kenell & Esser Co.	
Favorite, Ass Skin	40 to 10 to 50%
Favorite, Duck and Leather	

## Metallic and Steel, lower list.

Pocket	35 to 35 to 45%
Luffkin's	
Asses' Skin	40 to 10 to 50%
Metallic	30 to 30 to 45%
Patent Bend. Leather	25 to 25 to 10%
Pocket	40 to 40 to 45%
Steel	35 to 35 to 45%

## Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 5/8-inch and larger	per 100 lbs. \$3.00
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## Thermometers—

Tin Case	80 to 10 to 80 to 10 to 5%
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## Ties, Bale—Steel Wire

Single Loop	80 to 80 to 10%
Monitor, Cross Head, &c.	70%

## Brick Ties—

Niagara Brick Ties	25 to 10%
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## Tinners' Shears, &amp;c.—

See Shears, Tinners', &c.	
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## Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.	
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## Tips, Safety Pole—

Covert's Saddlery Works	60 to 10%
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## Tire Benders, Upsetters, &amp;c.

See Benders and Upsetters, Tire.	
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## Tools—Coopers'—

L. & I. J. White	20 to 20 to 5%
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## Hay—

Myers' Hay Tools	50%
Stowell's Hay Carriers	50%
Stowell's Hay Forks	50%
Stowell's Fork Pulleys	50%

## Saw—

Atkins' Cross Cut Saw Tools	40%
Simonds' Improved	35%
Simonds' Crescent	25%

## Ship—

L. & I. J. White	25%
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## Transom Lifters—

See Lifters, Transom.	
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## Traps—Fly—

Balloon, Globe or Acme, doz.	\$1.15 to \$1.25; gro. \$1.10 to \$1.20
Harper, Champion or Paragon, doz.	\$1.25 to \$1.40; gro. \$1.10 to \$1.30

## Game—

Oncida Pattern	75 to 10 to 75 to 10 to 45%
Newhouse	45 to 45 to 45%
Hawley & Norton	65%
Victor and Oneida	70 to 10 to 70 to 10 to 45%
O. C. Jump (Blake Pat.)	60 to 60 to 40 to 10%

## Mouse—

Mouse, Wood, Choker, doz. holes	85 to 90¢
Mouse, Round or Square Wire, doz.	85 to 90¢

## Marty French Rat and Mouse Traps

(Genuine):	
No. 1, Rat, each \$1.21; 1/2 doz. \$13.25	
No. 3, Rat, 1/2 doz. \$6.50; case of 50	\$5.75 doz.
No. 3 1/2, Rat, 1/2 doz. \$5.25; case of 72	\$5.00 doz.
No. 4, Mouse, 1/2 doz. \$3.85; case of 150	\$3.00 doz.
No. 5, Mouse, 1/2 doz. \$3.00; case of 150	\$2.25 doz.

## Trimmers, Spoke—

Wood's E I.	50%
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## Trowels—

Disston Brick and Pointing	30%
Disston Plastering	25%
Disston Standard Brand and Gar-den Trowels	35%
Kohler's Steel Garden Trowels, 5 in.	gro. \$4.80
Kohler's Steel Garden Trowels, 6 in.	gro. \$6.00
Never-Break Steel Garden Trowels	gro. \$6.00
Rose Brick and Plastering	25 to 45%
Woodrough & McParlin, Plastering	25%

## Trucks, Warehouse, &amp;c.—

B. & L. Block Co.	
New York Pattern	50 to 10%
Western Pattern	60 to 10%
Handy Trucks	doz. \$16.00
Grocery	doz. \$15.00
Daisy Stove Trucks, Improved Pat-tern	doz. \$18.50
McKinney Trucks	each \$10.00
Model Stove Trucks	doz. \$18.50

## Tubs, Wash—

No. 1	2 3
Galvanized, per doz.	\$3.50 5.00 5.75
Galvanized Wash Tubs (S. S. & Co.):	
No. 1	2 3
Per doz., net	\$5.70 6.30 7.20 6.00 7.20 8.10

## Twine, Miscellaneous—

Flax Twine:	
No. 9, 1/4 and 1/2-lb. Balls	22 to 24¢
No. 12, 1/4 and 1/2-lb. Balls	18 to 20¢
No. 18, 1/4 and 1/2-lb. Balls	16 to 18¢
No. 24, 1/4 and 1/2-lb. Balls	16 to 18¢
No. 36, 1/4 and 1/2-lb. Balls	15 to 17¢
Chalk Line, Cotton 1/2-lb.	
Balls	30¢
Cotton Mops, 6, 9, 12 and 15 lb.	
to doz.	9 to 11¢
Cotton Wrapping, 5 Balls to lb., according to quality	13 to 14¢
American 2-Ply Hemp, 1/4 and 1/2-lb. Balls	13 to 14¢
American 3-Ply Hemp, 1-lb. Balls	15 to 14¢

## India 2-Ply Hemp, 1/4 and 1/2-lb.

Balls (Spring Twine)	34¢
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## India 3-Ply Hemp, 1-lb. Balls

India 3-Ply Hemp, 1-lb. Balls	34¢
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## 2, 3, 4 and 5-Ply Jute, 1/2-lb.

Balls	9 to 10¢
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## Mason Line, Linen, 1/2-lb. Bls.

No. 26 1/2 Mattress, 1/4 and 1/2-lb. Balls	37¢
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## Wool, 3 to 6 ply

Wool, 3 to 6 ply	B 1 1/4¢; A 5¢
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## Vises—

Solid Box	60 to 10 to 60 to 10 to 10%
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## Parallel—

Athol Machine Co.	
Simpson's Adjustable	40%
Standard	40%
Amateur	25%
Columbia H.C. Co.	40%
Emmer Universal:	
Pattern Makers' No. 1	\$15.00; No. 2, \$12.50; No. 3, \$10.00.
Machinist and Tool Makers' No. 4	\$12.50; No. 5, \$7.00; No. 6, \$10.00.
No. 10	\$21.50
Jewellers	No. 7
Fisher & Norris Double Screw	15 to 10%
Hollands:	
Machinists	10 to 10 to 5%
Keystone	65 to 50 to 70%
Lewis Tool Co.	20 to 30%
Merrill's	20%
Millers Falls	60 to 10%
Massey Vice Co.	
Clincher	40%
Perfect	20%
Lightning Grip	20%

## Parker's:

Victor	20 to 25%
Regulars	20 to 25%
Vulcan's	40 to 45%
Combination Pipe	50 to 60%
Prentiss	20 to 25%
Sargent's	40%
Smith & Hemenway Co.	
Machinists	40%
Jewellers	35%
Snediker's	35%
Stephens	35%
Williamson Mfg. Co. Double Swivel	40%

## Saw Filers—

Diaston's D 3 Clamp and Guide, 3/4 doz.	\$3.00
Perfection Saw Clamps, 1/2 doz.	\$5.00
Refining	60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3	45 to 50%

## Wood Workers—

Massey Vice Co.	
Lightning Grip	15%
Perfect	15%
Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.	

## Miscellaneous—

Bigall & Keeler Combination Pipe	
Vise	60 to 10%
Holland's Combination Pipe	60 to 60 to 45%
Massey's Quick Action Pipe	40%
Parker's Combination Pipe:	
8 Series	60 to 60%
1st Series	60 to 60%
No. 870	40 to 40%
Williamson Mfg. Co. Double Swivel Combination Pipe	40%

## Wads—Price per M.

B. E., 11 up	60¢
B. E., 9 and 10	70¢
B. E., 8	80¢
B. E., 7	80¢
P. E., 11 up	\$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B. E., 11 and larger	\$1.70 to \$1.75
Ely's P. E., 12 to 20	\$3.00 to \$3.25

## Ware, Hollow—

Cast Iron, Hollow—	
Stove Hollow Ware:	
Enameled	50 to 55 to 10%
Ground	55 to 60 to 10%
Plain or Unground	60 to 65 to 10%
Country Hollow Ware, per 100 lbs.	\$2.75 to \$3.00

## White Enameled Ware:

Mastin Kettles	70%
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## Covered Ware

Tinned and Turned	40%
Enameled	50%

## See also Pots, Gluc.

## Enameled—

Agate Nickel Steel Ware	50 to 50%
Agate Nickel Steel Ware, Specials	60 to 15%
Iron Clad Ware	70 to 10%
Lava, Enameled	40 to 10%
Never Break Enameled	50%

## Tea Kettles—

Galvanized Tea Kettles:	
Inch	6 7 8 9
Each	45¢ 50¢ 55¢ 65¢

## Steel Hollow Ware—

Avery Spiders and Griddles	65 to 65%
Avery Kettles	60%
Porcelain	50 to 40 to 10%
Never Break Spiders and Griddles	65 to 65%
Never Break Kettles	60%
Solid Steel Spiders and Griddles	65 to 65%
Solid Steel Kettles	60%

## Warmers, Foot—